Harmony ball bearings

Below you will find two ball bearings that are for sale. They are more efficient than conventional ball bearings with low friction and can withstand heavy loads. They lead to lower fuel consumption, lower noise, smooth running of the axle, longer life of the ball bearing, lower operational temperature and lower possibility of malfunction. A car is equipped with 100 to 150 ball bearings. They are revolutionary.

The following is patented.

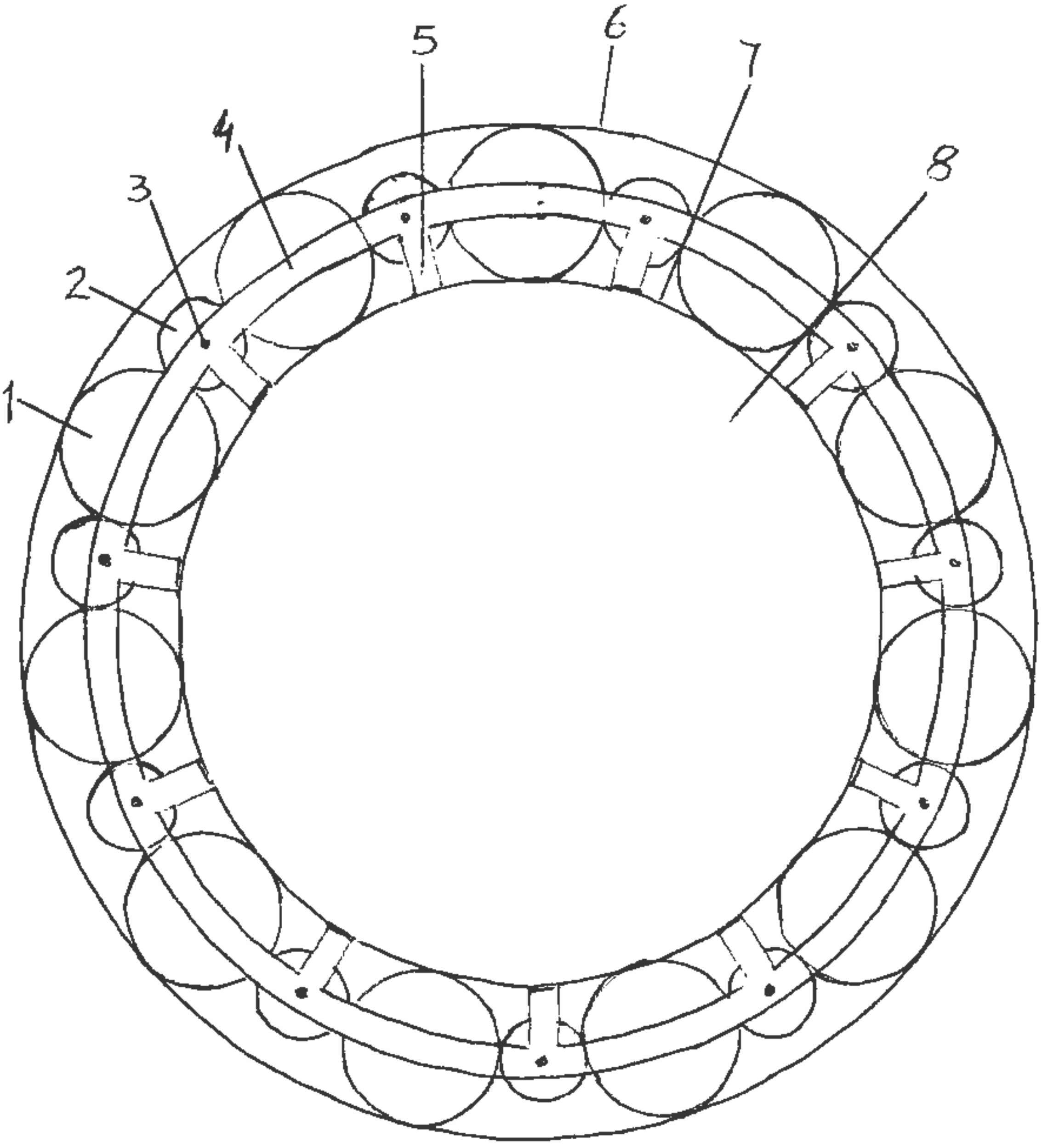

FIG.1

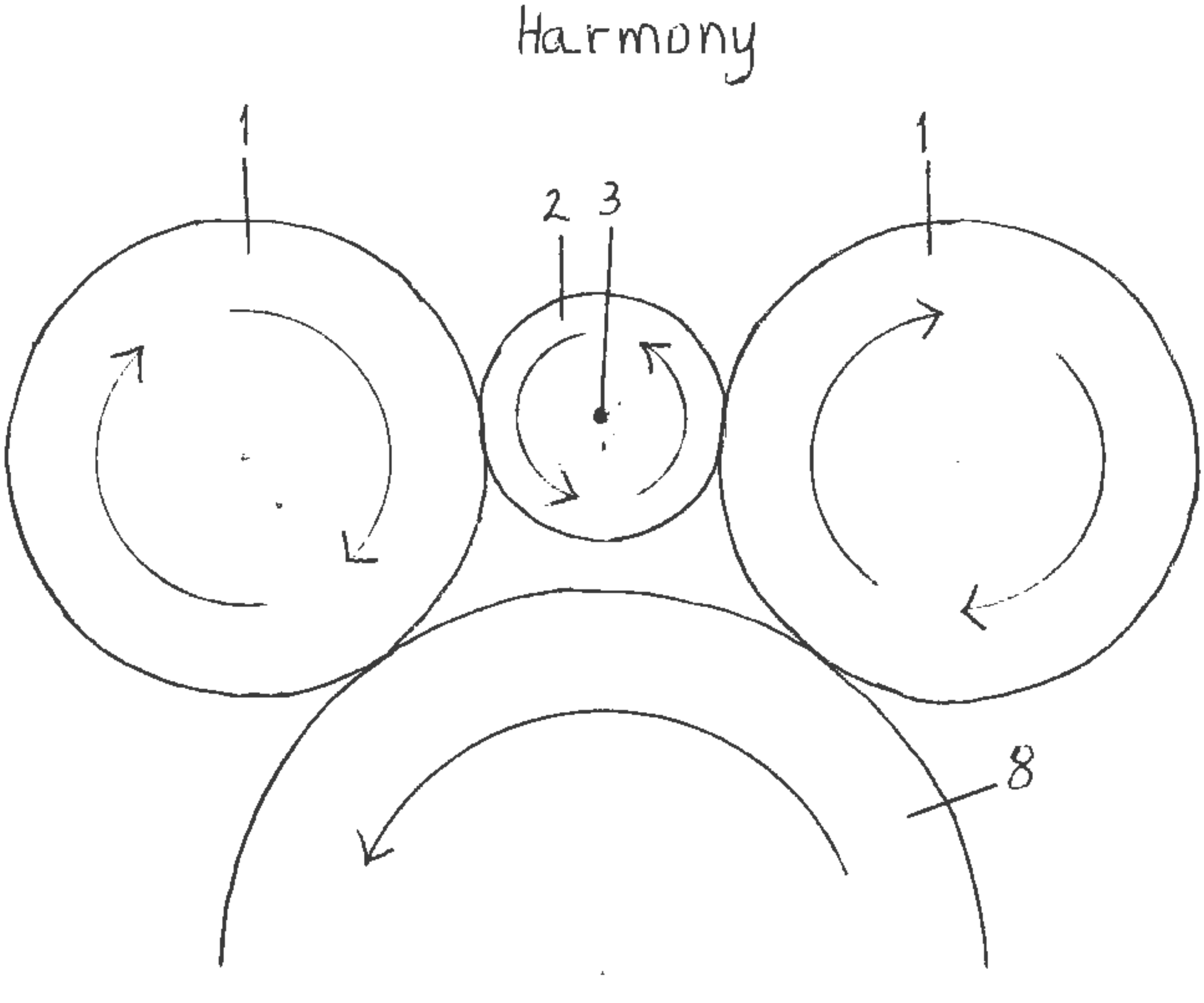

FIG.2

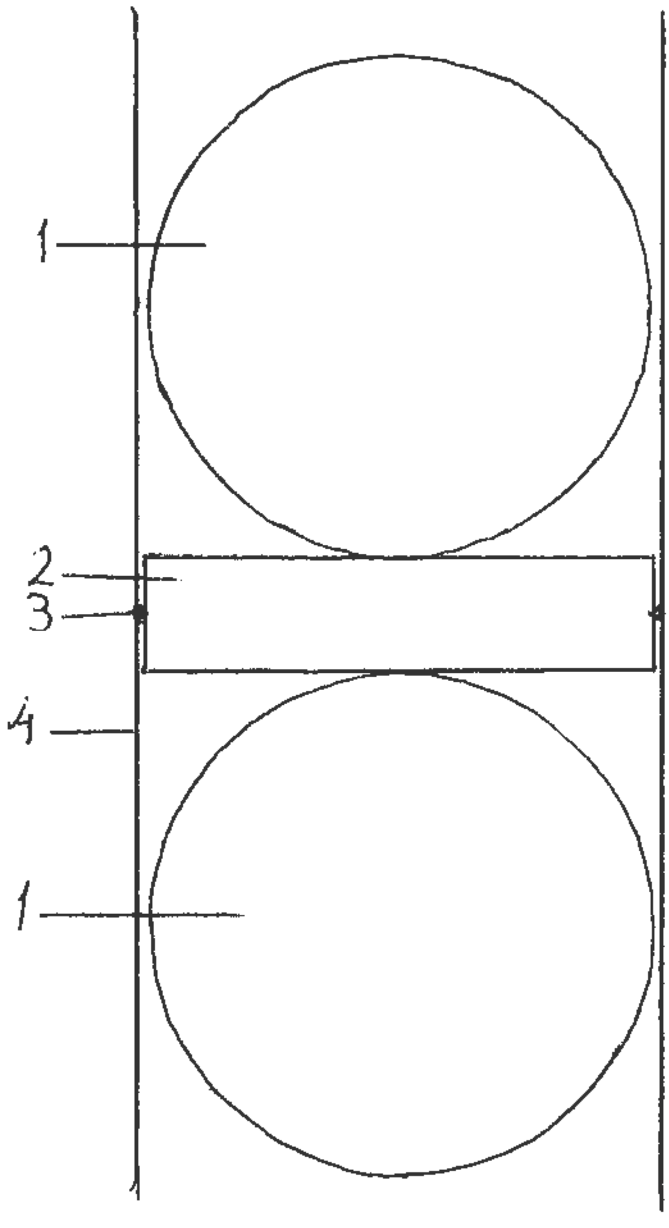

FIG.3

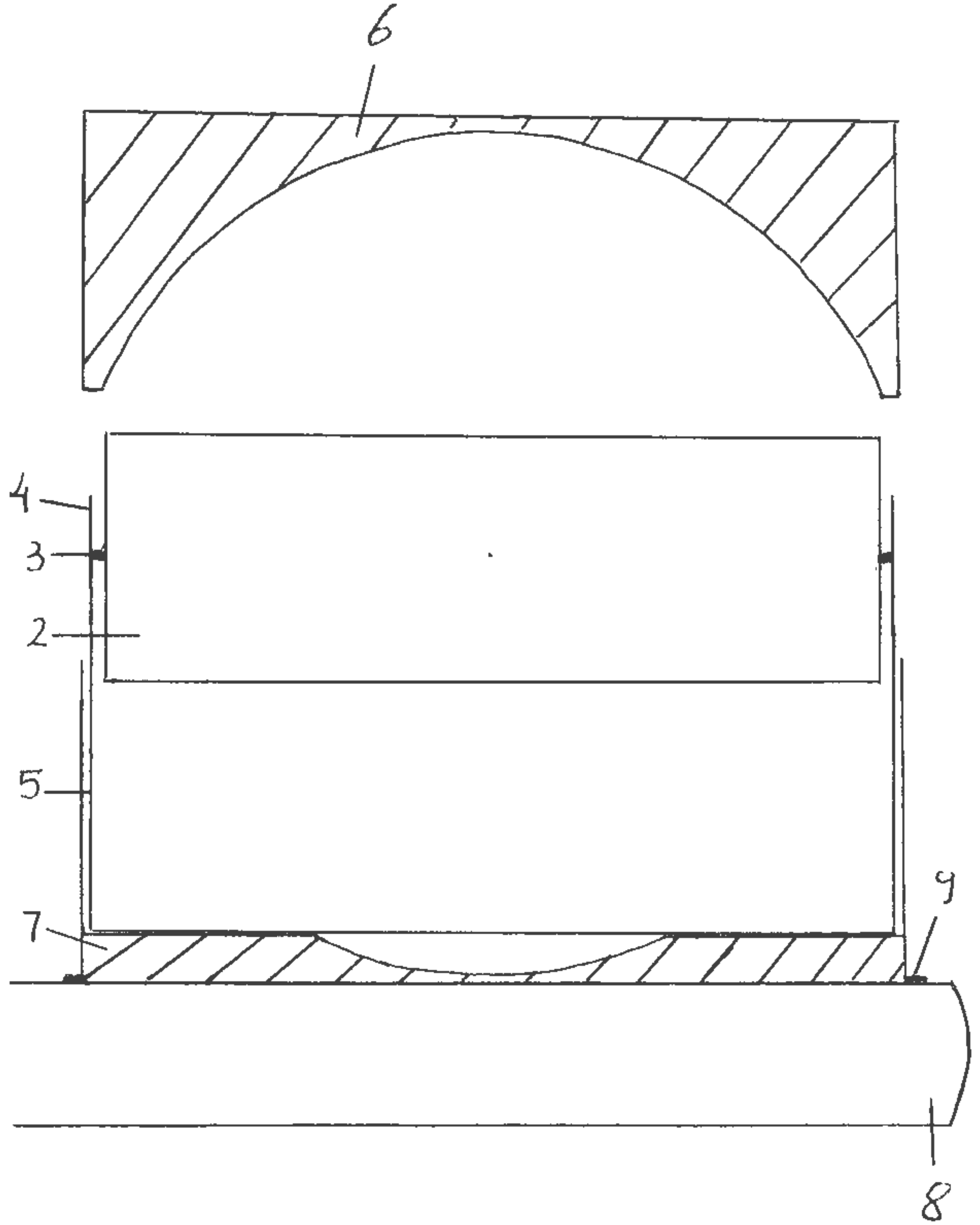

FIG.4

Harmony ball bearing

A ball bearing is the basis of the machine. It allows the various parts, shafts to rotate freely. Its uses are in machines, wheels generally shafts that rotate. Conventional bearings consist of balls placed to each other contained by an inner and outer rings, old bearing, prior art. A more recent bearing: the balls are contained in sockets of a cage do not touch each other but touch the sockets of the cage and the inner and outer rings, prior art. There is a need for an efficient bearing that can withstand load. An efficient bearing means low fuel energy consumption, low noise, smooth running of the axle, shaft and thus of the machine, longer life of the ball bearing and of the machine, lower operational temperature of the ball bearing and low possibility of malfunction. A car is equipped with 100 to 150 ball bearings, almost every machine needs ball bearings and wheels have ball bearings. They are essential. The harmony ball bearing consists of parts that move in agreement with each other. The balls that hold the load move freely.

In this invention the balls move freely. Their contact in front and on the rear are with rollers (cylinders) that move in harmony with the balls, in opposite circular direction with the balls. In other words, the balls move clockwise the rollers anti-clockwise. There is a ball then a roller then a ball and so on. That is the balls and the rollers are positioned alternately. The rollers rotate around axles. These axles are attached to a cage. A cage with stands that extend and have contact with the rotating inner ring. Therefore, the cage rotates. The rollers are small in diameter than the balls so they do not touch either the inner ring or the stationary outer ring. They only touch their axles and the balls. Therefore, only the balls are in contact with the outer stationary ring and the inner ring moving in circular motion.

Conventional bearings consist of balls next to each other rotating in opposite directions thus they collide, or they are in a cage which its sockets do not rotate in accordance with the rotating balls causing friction. They are not extremely efficient. The harmony ball bearing consists of rollers that are not in contact with the rotating inner ring 7 nor with the stationary supporting ring 6. They take movement from the balls 1 and their rotational movement agree with the movement of balls.

FIG.1 illustrates the rotating inner ring touching only the balls 1 causing the balls to move in opposite direction than the inner ring. The balls touch the rollers 2 causing them to move in opposite direction than the balls. Therefore, all the rollers move in agreement with all the balls. What contains the balls and the rollers is the cage 4. The balls inside the cage move freely while the rollers are positioned around axles 3 that are fastened to the cage. As the shaft rotates it rotates the inner ring which rotates the balls and the cage. The cage rotates due two forces. The first is the rotating inner ring which touches the stands 5 of the cage. The second is the balls that push the rollers in the direction of the rotating shaft. These two forces are in the same direction. The balls rotate the rollers.

FIG. 2 demonstrates the movement of the balls 1, the rollers 2 and the shaft 8. They move in harmony. The shaft moves anti-clockwise, the balls clockwise and the roller anti-clockwise. The movement comes from the shaft the inner ring is attached to it and it moves the two balls. The balls 1 move the roller 2. The roller rotates around an axle 3.

FIG. 3 is a view from the top showing 2 balls 1, the roller 2 rotating around the axle 3 which is attached to the cage 4. The walls of the cage in Fig. 3 the vertical lines are slightly wider than the contained balls for the balls to rotate freely without friction. The balls rotate rotating thus the roller 2. The balls should not fit tightly with the rollers because when the ball bearing works for a considerable time the temperature rises causing the balls and the rollers to expand pushing each other and preventing the ball bearing from running smoothly.

FIG. 4 is a longitudinal view of the ball bearing without the ball. The shaft 8 which rotates the inner ring 7 and are connected with a metal strip, attachment 9. Between the inner ring 7 and the stand of the cage 5 there is a tiny space which is the lubricant. There is the possibility that the cage 4 will move faster than the balls thus the rollers 2 will touch the balls from behind a lubricant will make this touch weak. The harmony ball bearing should initially be made without using lubricant and observe the relation between the cage and the balls. The ideal is the rollers not to touch the balls either in front or behind. If the rollers touch the balls from behind the number of stands 5 could be reduced. For example, not under every axle 3 should there be a stand but under numbers 1, 3, 5, 7, 9, 11 axles. At the top it is the stationary outer ring 6 which holds the balls 1.

Parts (see FIG 1 above):

1, balls are placed between rollers they are larger than the rollers preventing the rollers to touch either the rotating inner ring or the stationary outer ring. The rollers touch only the balls. The balls should be made of steel and have such radius that do not touch the cage -the sides of the cage- or the rollers when stationary reducing friction and give room for expansion from heat.

2, rollers should be made of steel. They are cylinders with a hole of the cross section. The radius of the hole should be half of the radius of the cylinder. The rollers should be slightly shorter in length than the distance between the 2 sides of the cage to avoid friction with the sides of the cage. The radius of the roller should not be either too small or too big. At first sight the size of the radius does not matter as far as friction is concerned because Friction=μF. Where μ is the coefficient of friction and F is the force which pushes the roller to the axle. However, when the roller is small in radius it rotates with higher circular velocity. Higher circular velocity means more friction. A large roller rotates with lower circular velocity and suffers less friction. The drawback of a large roller is that the distance between the balls, which them alone hold the load, is big rendering the ball bearing incapable of holding heavy loads. Therefore, the radius of the roller with the axle inside it should be 1/4 to 1/2 of the radius of the ball. The rollers are cylinders. They can be spherical like a ball or cones: two cones which their edges meet in the center resembling a water clock. If the rollers are spherical the balls 1 will either move left or right touching the sides of the cage. If the rollers are like cones the balls will push the cones (rollers) to the left or to the right thus the cones (rollers) will have friction with the sides of the cage when they rotate.

3, axle is attached to the cage. A hole is made above the stand 5 and it is in the middle of the width of the circular ring of the cage as seen in fig. 1. The axle is inserted between the 2 holes of the 2 sides of the ring of the cage. The axle is made of steel. Here lubrication is vital between the axle and the roller which are in contact. The height of the axle is the radius of the ball 1 minus the curvature (if there is one) of the inner ring 7, see fig. 4.

4, cage consists of two identical rings that are connected with the stands 5. They are rings with extensions, stands 5 below the holes of the axles 3.

5, stands are extensions, strips that start from the ring of the cage go down until they reach the inner ring then they turn 90 degrees going until they meet the strip from the other ring of the cage. The stands of the cage touch the inner ring so there is the possibility of using lubricant. For the lubricant to not enter the stands, the stands should be U shaped as seen from the side letting the lubricant to pass under the stand and not above it. Also, U shaped stands reduce the friction between the stands and the inner ring. If the stand is flat and not U shaped it will touch the inner ring much more than if it was U shaped (semicircle).

6, the outer ring which is stationary and is fixed to the surrounding element. It is circular.

7, the inner ring which rotates with the same circular velocity as the shaft because it is attached to it by screws or ditches. It could be flat or with a curvature to hold the balls.

8, shaft the big rotating axle that is in contact with the inner ring of the ball bearing.

9, attachment of the inner ring to the rotating shaft by screw or ditch in fig. 4. This attachment is a metal strip, extension of the inner ring 7.

1

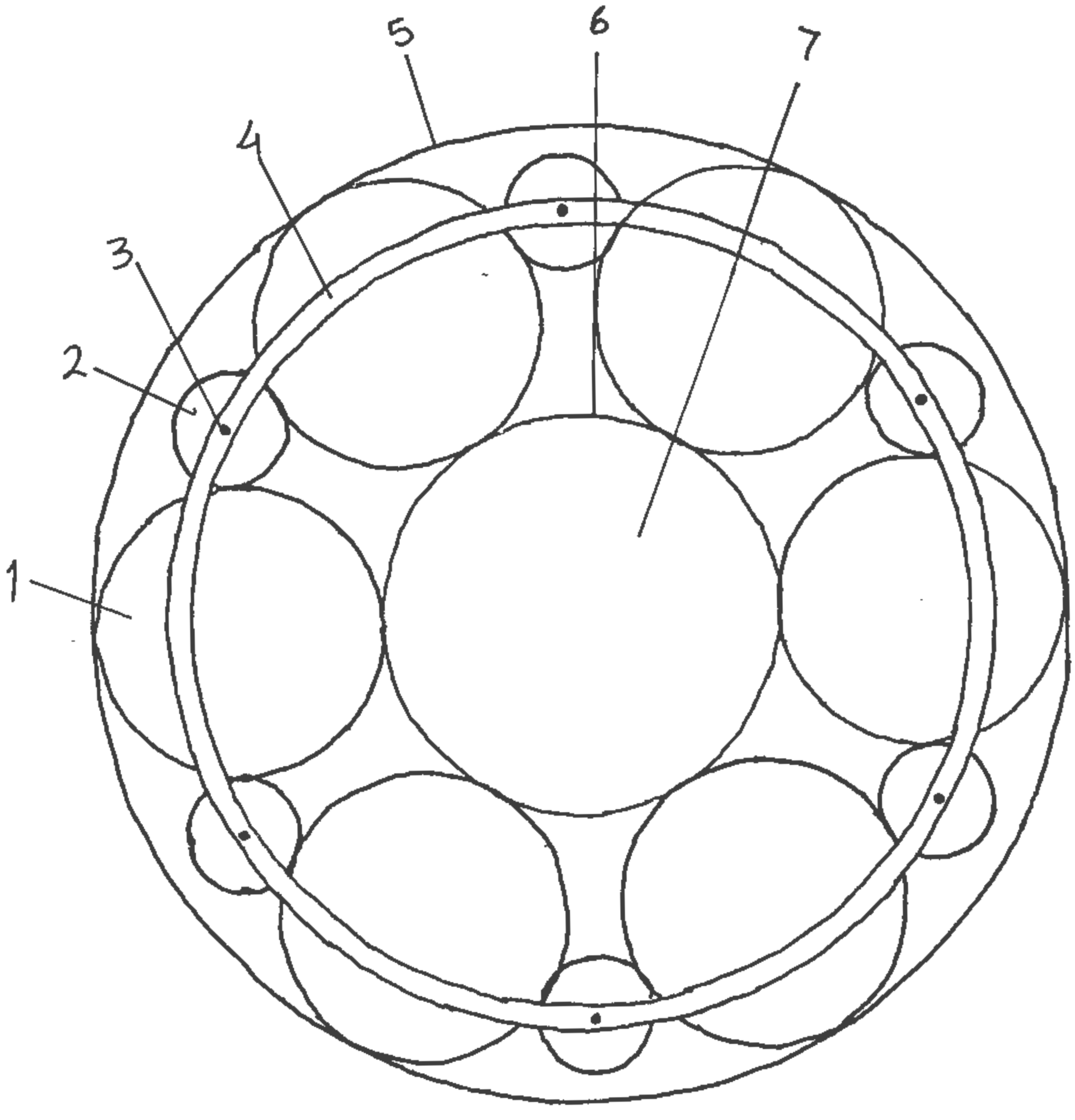

FIG.1

Harmony

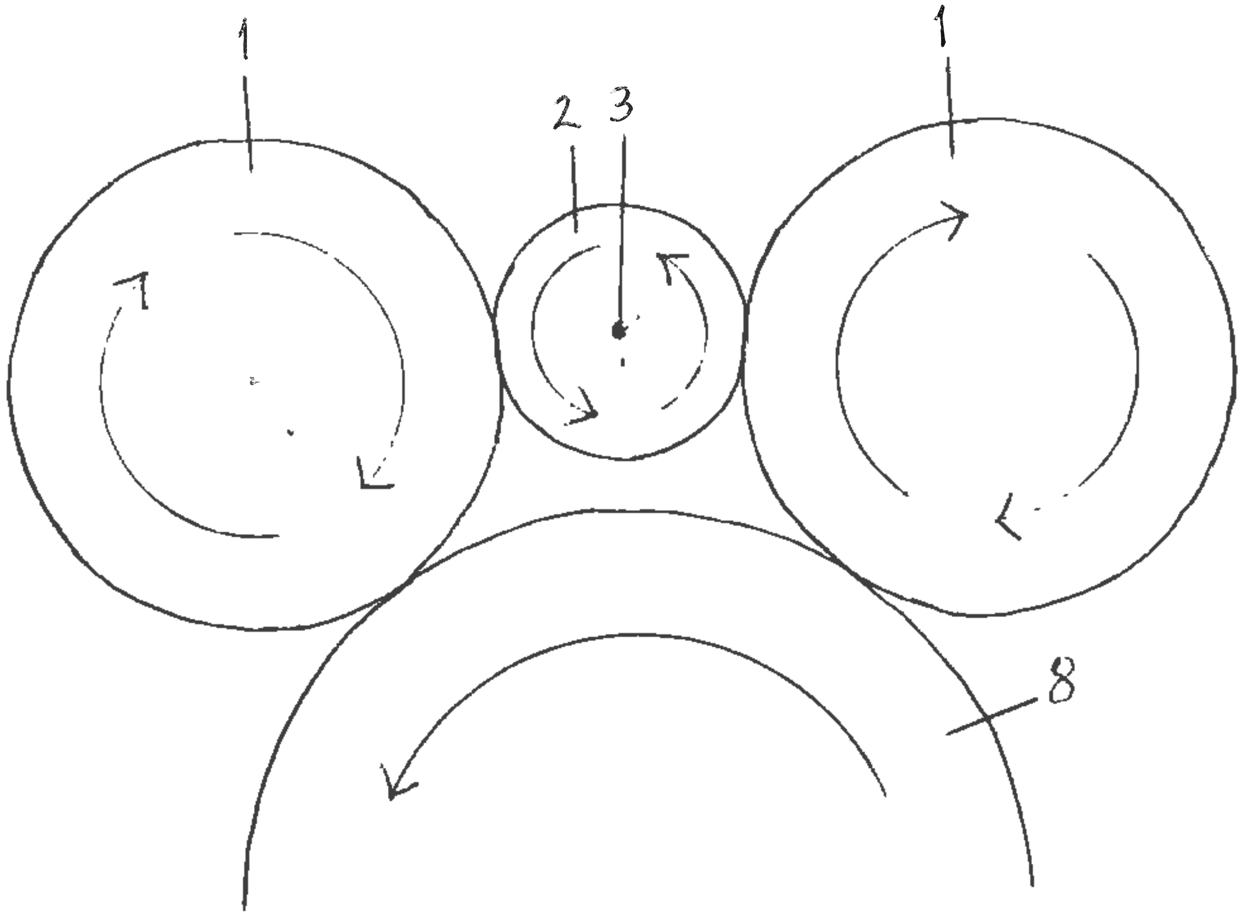

FIG.2

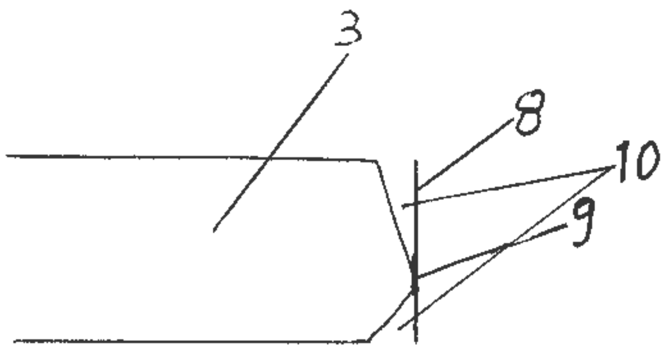

FIG.3

Harmony-J ball bearing

A ball bearing is the basis of the machine. It allows the various parts, shafts to rotate freely. Its uses are in machines, wheels generally shafts that rotate. Conventional bearings consist of balls placed to each other contained by an inner and outer rings, old bearing, prior art. A more recent bearing: the balls are contained in sockets of a cage do not touch each other but touch the sockets of the cage and the inner and outer rings prior art. There is a need for an efficient bearing that can withstand load. An efficient bearing means low fuel energy consumption, low noise, smooth running of the axle, shaft and thus of the machine, longer life of the ball bearing and of the machine, lower operational temperature of the ball bearing and low possibility of malfunction. A car is equipped with 100 to 150 ball bearings, almost every machine needs ball bearings and wheels have ball bearings. They are essential. The harmony-J ball bearing consists of parts that move in agreement with each other. The balls that hold the load move freely.

Describing the parts of the ball bearing as in FIG. 1, above:

1. Balls, bigger than the rollers (cylinders) (2), which touch the inner ring (6) and the outer ring (5) receiving motion from the inner ring and supporting the outer ring. They rotate and hold and support the weight (load).

2. rollers that are cylinders rotating around the rods (3). The rods (3) are fixed to the circular cage. The rollers receive motion from the balls.

3. rods (axles) that are steel cylinders they do not rotate because they are fixed to the cages (two circular rings) (4). They hold the rollers (2) and allow the rollers to rotate.

4. circular cages one at the top (as in diagram (FIG. 1) cross section) and the other at the bottom. What holds the two circular cages are the rods (3) and the cages hold the rods (3). When the shaft (7) rotates the cages move circularly in the direction of the balls (1) that rotate.

5. the outer ring that is static (does not move). It touches only the balls (1). It takes the weight and transfers it to the balls.

6. Inner ring that rotates as the shaft (7) rotates. It is fixed to the shaft (7).

7. Shaft that rotates giving motion to the inner ring (6). The inner ring gives motion to the balls (1) and the balls give motion to the rollers (2).

As the shaft (7) rotates the inner ring (6) rotates at the same circular velocity because the inner ring is fixed to the shaft (7). The inner ring touches the balls (1). Therefore the balls (1) rotate. If the shaft (7) and the inner ring rotate counter clockwise the balls rotate clockwise. The balls hold the weight (load). The rollers do not touch either the inner ring (6) nor the outer ring (5) they are in conduct with the balls and if the balls rotate clockwise the rollers rotate counter clockwise. The rollers (2) rotate because inside them they have holes that the rods (3) are inserted. The rods are fixed to the cage but they can rotate if they have discs 8 (see FIG.3) the discs 8 are fixed, one with the rods 3 and there is a steel clip 9 which is elastic attached between the rods 3 and the discs outside the cages and the rods are slightly smaller than the holes of the cages. It is better for the rods to move. There is less resistance from the rotation of the rollers.

Manufacture of the ball bearing Harmony – J

It seems complicated to manufacture this ball bearing in fact it is simpler.

First you draw the ball bearing by using a protractor if you choose to have 6 balls every 360/6=60 degrees you have a ball.

1. You draw a circle using a compass. Then you draw a line that passes its center and every 60 degrees using a protractor you draw a line. You draw the outer circle (outer ring (5)). By using the compass placing it at half the distance, using a ruler, between the inner circle and the outer circle, this is the center of the ball, you draw a circle these are the balls.

2. Next you draw the rollers which should be smaller than the balls they must be higher than the center of the balls (for the cage not to fall or get stuck) but not so high that they touch the outer ring.

When you complete the drawing the real ball bearing will have the proportions of the diagram. For example, 1/3 is the inner ring 1/3 are the balls 1/3 are the rollers and 1/3 is the outer ring of the diagram.

When you manufacture this ball bearing firstly you use the protractor to place the holes of the cage, just like the diagram, you fix the rods inside the holes of the cage and then you insert the rollers on the rods. Please see FIG. 3 the rods 3 have two ditches 10 on both sides to place steel clips 9 to hold the rollers in the cage. You do not place the top cage yet.

Secondly you insert the balls and then the top cage.

You draw first the ball bearing to determine the size of the rollers.

The price for both of my inventions is 5 million euros. I have thought of these inventions since long ago. I know that there is too much hassle in the world because of my inventions. That is why i accept the estimate of an independent, unbiased, expert estimator.

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