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Gentiluomo

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[54] **CENTERLESS THICK-WALLED GAME BALL**

[76] Inventor: **Joseph A. Gentiluomo,** 1456 Belmont Ave., Schenectady, N.Y. 12308

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Related U.S. Application Data

[62] Division of Ser. No. 142,565, May 12, 1971, abandoned.

[52] **U.S. Cl.** ..... **273/60 R;** 273/230

[51] **Int. Cl.²** **A63B 37/02**

[58] **Field of Search** ..... 273/60, 225, 58 B, 58 BA

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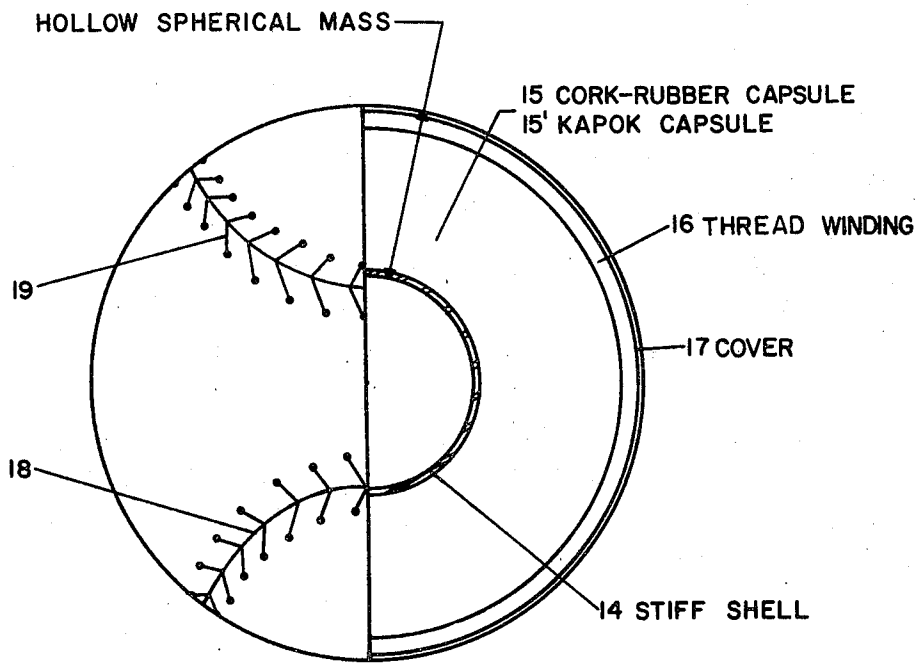
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Primary Examiner—George J. Marlo

[57] **ABSTRACT**

A game ball for baseball and softball having a hollow center and capable of being manufactured to required size and weight specifications. The function of the hollow center is to increase the ball's moment of inertia by redistributing the weight of the removed central mass toward the outside of the ball, thus, providing for more stable flight. The increase in moment of inertia will operate to decrease the ball's Magnus Effect, thus, providing for truer ball flight under windy conditions, and also decrease its dispersion angle such that fewer balls will be fouled out-of-bounds.

11 Claims, 2 Drawing Figures



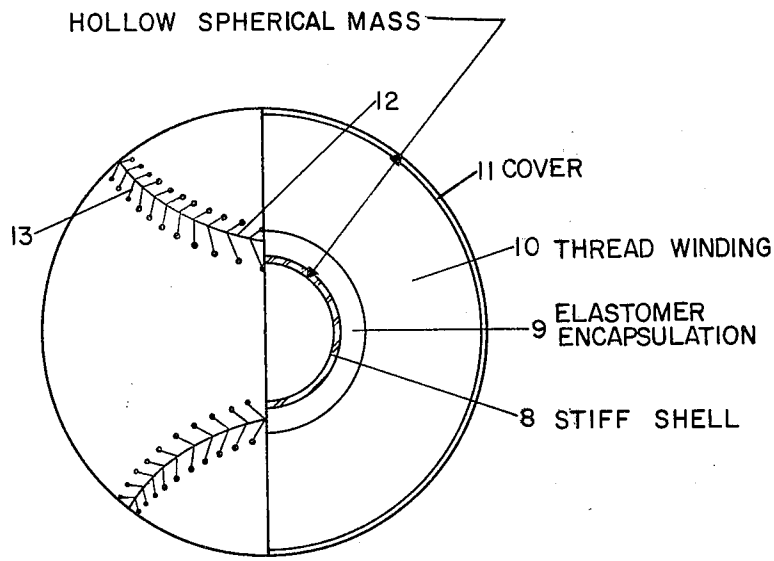

HOLLOW SPHERICAL MASS
12
11 COVER
13
10 THREAD WINDING
9 ELASTOMER ENCAPSULATION
8 STIFF SHELL

FIG. 1

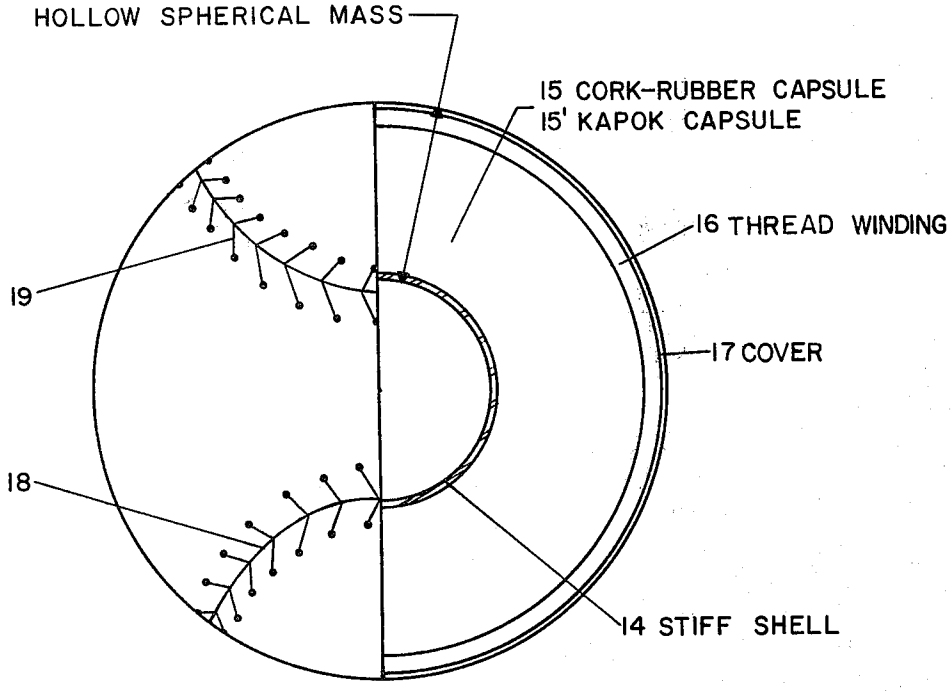

HOLLOW SPHERICAL MASS
15 CORK-RUBBER CAPSULE
15' KAPOK CAPSULE
16 THREAD WINDING
19
17 COVER
18
14 STIFF SHELL

FIG. 2

CENTERLESS THICK-WALLED GAME BALL

This is a division of application Ser. No. 142,565, filed May 12, 1971, now abandoned.

This invention pertains to game ball construction, and more particularly to balls such as, baseballs, and softballs which require a predetermined size, weight, and proper degree of resiliency and flight stability to travel an optimum distance after being struck.

Baseballs are constructed as filled or solid multi-piece units generally having a rubber covered cork core wound tightly with wool yarn and covered with two bis-patular pieces of white leather. Some balls have solid rubber centers.

Softballs also appear as filled or solid multi-piece units generally having either a molded rubber-cork composition or a compressed kapok center wound with thread. The kapok center is generally rubber sealed. Also, a low priced ball is available generally made with a compressed kapok center encapsulated in a cellular rubber or latex cover.

All cited balls are susceptible to substantial sidespin when hit, thereby, causing a baseball and softball to be frequently hit foul out-of-bounds. This sidespin can be substantially reduced by distributing the ball's mass more effectively to lessen side thrust to thus improve its performance. The instant invention discloses a novel centerless ball functional in reducing unwanted side-spin induced through improper application of a ball striking implement.

Cited foul ball hitting can be substantially reduced by decreasing the ball's sidespin velocity. Said spin or rotational velocity is reduced through increase in ball moment of inertia, by locating the ball's mass as much toward the outside of the ball as possible. This is accomplished by removing the mass from the center of the ball, and through various means relocating or redistributing the weight of said removed central mass such that it is contained within the ball's thick-walled hollow mass.

Rotation of said balls in a viscous fluid such as air, produces a dynamic lift force known as the Magnus Effect. The term dynamic lift also pertains to the side thrust experienced by a ball when it is fouled out-of-bounds. This lift force is equal to the product of the air density, the velocity of the ball through the air, and a quantity termed "circulation" which is directly proportional to the ball's angular velocity. Now, being that the initial velocities of propagation of both the solid and the centerless ball described above are the same when hit, and the angular velocity of the centerless ball is less than the solid ball, the dynamic lift on the centerless ball will be less than that experienced by the solid ball. Since the dynamic lift or Magnus Effect is less on a hollow type ball than on a solid ball of equal mass, the centerless ball will have a reduced tendency to deviate from a straight line trajectory to cause the hitting of baseballs and softballs foul, thereby, effectuating a tighter dispersion pattern.

It now becomes apparent that the main intent of this invention is to provide a centerless game ball for, baseball, and softball which has substantially improved aerodynamic characteristics.

Accordingly, objects of this invention are as follows:

To provide a ball construction which is applicable toward the manufacture of many types of game balls such as baseball, softball, etc.

To provide a ball that will have better play characteristics than presently available conventional game balls such as baseballs, softballs, etc.

To provide a game ball that can be manufactured with excellent roundness and balance.

To provide a game ball having a substantially stiff innermost spherical sheel to act as a base from which the surrounding elastic mass can operate during ball compression and recovery.

To provide a game ball that will more fully satisfy the demands of players of varying skills.

To provide a baseball, and softball that is more stable and capable of holding a truer flight on a windy day due to the effects of its greater moment of inertia.

To provide a baseball and softball that is less susceptible to being fouled out-of-bounds due to its decreased Magnus Effect.

To provide a baseball and softball having the desired sharp impact sound and good feel when hit.

These objects and other objects will become apparent when taken in conjunction with the description, claims, and the accompanying drawings, in which:

FIG. 1 depicts a schematic isometric view of a coreless baseball partially in schematic section.

FIG. 2 depicts a schematic isometric view of a coreless softball partially in schematic section.

Terms herein utilized should bear interpretation as follows:

Moment of Inertia: It is defined as the sum of the product of the mass of each particle in a rigid body and the square of its distance from a common axis, or the ratio of the resultant external torque to the angular acceleration with respect to said axis.

Thick-walled Hollow Spherical Mass: It pertains to an aggeegation of particles or parts regarded as forming one thick-walled hollow spherical body or ball. It is a ball composed of one or more elements so constructed as to provide said ball with a filled interior, free of cavities, from its outer surface inward.

Ball Size: Pertains to the external dimensions of the ball.

CENTERLESS BASEBALL

This ball can be manufactured in several varying forms. With reference to FIG. 1, it can be discerned that the depicted embodiment exists basically as a four-piece unit constructed as a substantially thick-walled hollow spherical mass consisting of a stiff spherical central shell 8, and a thick-walled resilient mass. Said shell 8 is made preferably from steel, and said resilient mass is composed of an elastomer encapsulation 9, thread winding 10, and cover 11 secured over said winding by means of a patterned sewn seam depicted as 12 and 13. Said winding is wound about said elastomer 9 and may be constructed similar to a conventional ball which has a first layer of rough texture woolen yarn, a second layer of medium texture woolen yarn, a third layer of fine texture woolen yarn, and finally a layer of thin cotton string for presenting a substantially smooth surface underneath cover 11. Said cover consists of two bis-patular piece of white leather so shaped as to fit together tightly as a single thickness cover over said string by sewn thread 13. This ball according to regulations is restricted to a weight of between 5 to 5¼ ounces and a circumference of from 9 to 9¼ inches.

In operation, said ball deforms and flattens against said shell at the area of impact. Upon recovery, said

thick-walled resilient mass will bear against said shell to forcefully spring back to return the ball to its original spherical shape, and in so doing provides a sharp sound upon propelling away from the bat. Centerless Softball

This ball can also be manufactured in several varying forms. With reference to FIG. **2**, it can be discerned that the depicted embodiment exists basically as a four-piece unit constructed as a substantially thick-walled hollow spherical mass consisting of a stiff spherical central shell **14**, and a thick-walled resilient mass. Said shell **14** is preferably steel, and said resilient mass is composed of a substantially thick cork-rubber composition capsule **15**, thread winding **16**, and cover **17** secured over said winding by means of a patterned sewn seam depicted as **18** and **19**. Said winding **16** is wound about said capsule **15** for aiding toward supporting and sustaining said capsule's spherical shape. Surrounding said winding **16** is cover **17** consisting of two bispatular piece of white leather so shaped as to fit together tightly as a single thickness cover sewn together by thread **19**. This regulation ball, according to the International Joint Rules Committee on Softball, is restricted to a weight of **6** to **6¾** ounces and a circumference of from **11⅞** to **12⅛** inches.

A second embodiment can be constructed to have a thick kapok capsule **15'** compressed around said spherical central shell **14**, and rubber sealed to contain said kapok. Said capsule **15'** is wound with thread **16** to the proper diameter and then coated with rubber cement for adhesion of cover **17**. Said cover **17** consisting of two bispatular pieces of white leather is sewn together by thread **19** such as depicted in FIG. **2**.

Said softballs function similar to a baseball, but with reduced trajectory.

Having thusly described the invention, I claim:

1. A hollow game ball for use in playing such games as baseball or softball, comprising, a thick-walled hollow spherical mass of such weight distribution as to have a moment of inertia greater than the moment of inertia of a filled ball of equivalent size and weight, and sewn patterned contouring disposed within the exterior surface of said hollow spherical mass; said greater moment of inertia over said filled ball being of such magnitude as to cause a reduction in Magnus Effect to such a level as to provide improved aerodynamic characteristics.

2. The invention as defined by claim **1**, wherein said ball is further characterized as a baseball and said hollow spherical mass is further characterized as composed of a spherical shell surrounded by a resilient mass.

3. The baseball as defined by claim **2**, wherein said spherical shell is further characterized as being made of steel; and said resilient mass as being composed of a spherical elastomer encapsulating said shell, thread winding surrounding said spherical elastomer, and a cover secured over said winding by means of a patterned sewn seam.

4. The baseball as defined by claim **3**, wherein said thread winding is further characterized as composed of a first layer of rough texture wool yarn, a second layer of medium texture wool yarn, a third layer of fine texture wool yarn, and a final layer of thin string.

5. The baseball as defined by claim **4**, wherein said cover is further characterized as composed of bispatular pieces of leather sewn together.

6. The baseball as defined by claim **5**, further characterized as being **9** to **9¼** inches in circumference and **5** to **5¼** ounces in weight.

7. The invention as defined by claim **1**, wherein said ball is further characterized as a softball, and said hollow spherical mass is further characterized as composed of a spherical shell surrounded by a resilient mass.

8. The softball as defined by claim **7**, wherein said spherical shell is further characterized as being made of steel; and said resilient mass as being composed of a spherical cork-rubber composition encapsulating said shell, thread winding surrounding said cork-rubber composition, and a cover secured over said winding by means of a patterned sewn seam.

9. The softball as defined by claim **7**, wherein said spherical shell is further characterized as being made of steel; and said resilient mass as being composed of compressed kapok surrounding said shell, an elastomer seal encapsulating said kapok, a layer of thread wound around said elastomer seal, and a cover secured over said thread winding by means of a patterned sewn seam.

10. The softball as defined by claim **9**, wherein said cover is further characterized as composed of bispatular pieces of leather sewn together.

11. The softball as defined by claim **10**, further characterized as being **11⅞** to **12⅛** inches in circumference and **6** to **6¾** ounces in weight.

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