United States Patent

[11] 3,547,439

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[22] Filed **Jan. 8, 1968**
Division of Ser. No. 207,694,
July 5, 1962, Pat. No. 3,362,710.
[45] Patented **Dec. 15, 1970**

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[54] **POOL BALLS SEPARABLE BY MAGNETIC FORCES**
9 Claims, 10 Drawing Figs.

[52] **U.S. Cl.** **273/59,** 209/111.8
[51] **Int. Cl.** **A63b 47/00,** A63b 37/02
[50] **Field of Search** ..... 273/59, 58(I), 119(A), 2, 11

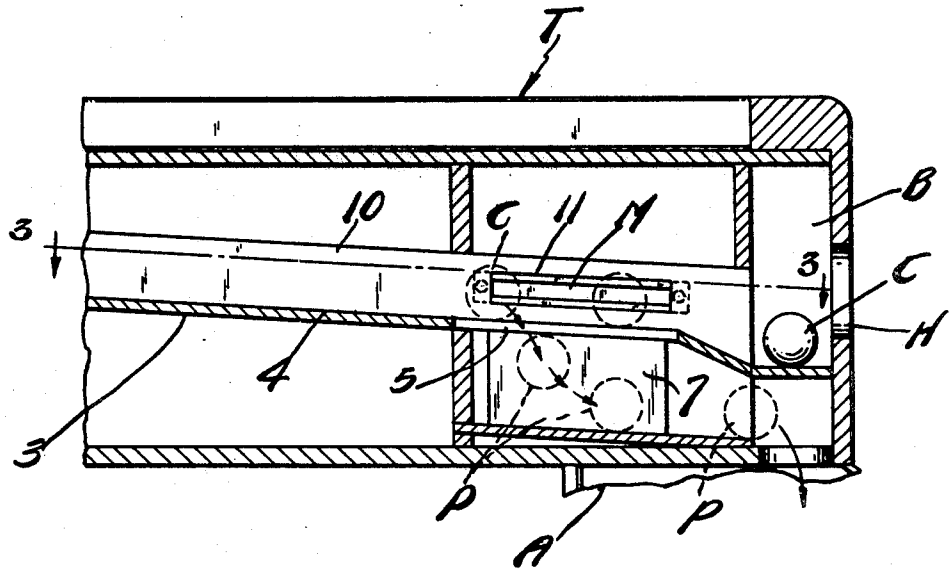
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ABSTRACT: A complement of spherical, uniform size pool balls comprising a plurality of nonmagnetic object balls, and a cue ball including a spherical body of nonmagnetic material and magnetic means embedded in the body concentrically with the center of the body intermediate the portions of nonmagnetic material.



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SHEET 1 OF 3

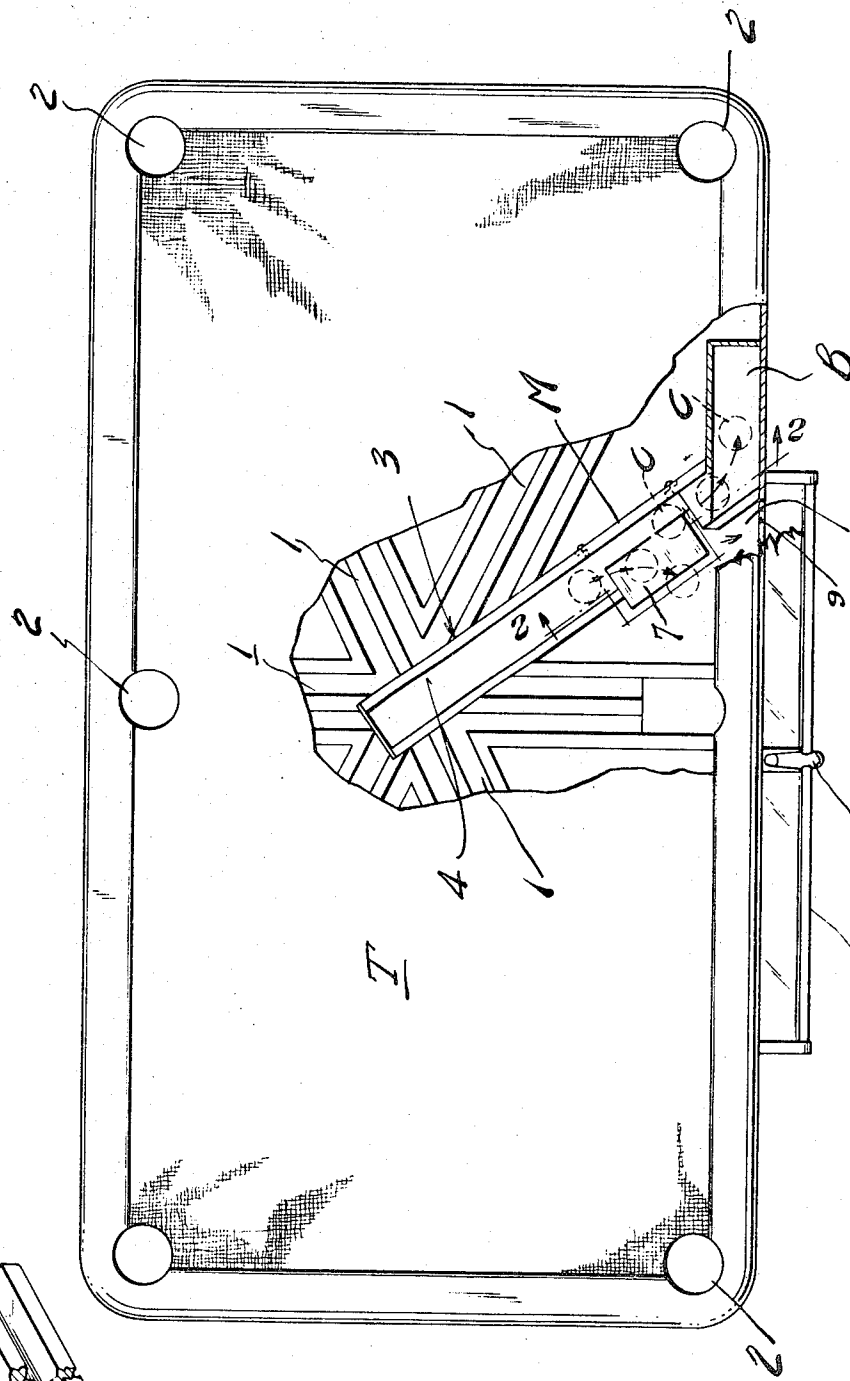


Fig. 1

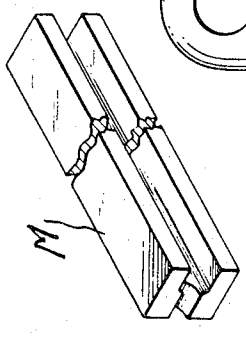


Fig. 9

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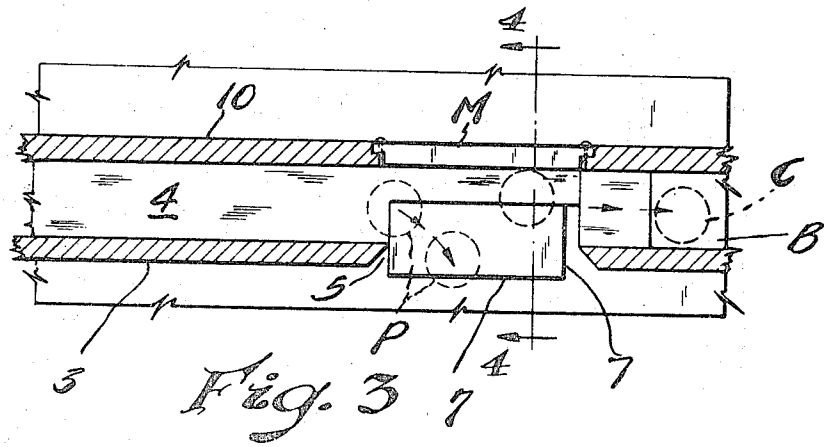


Fig. 3

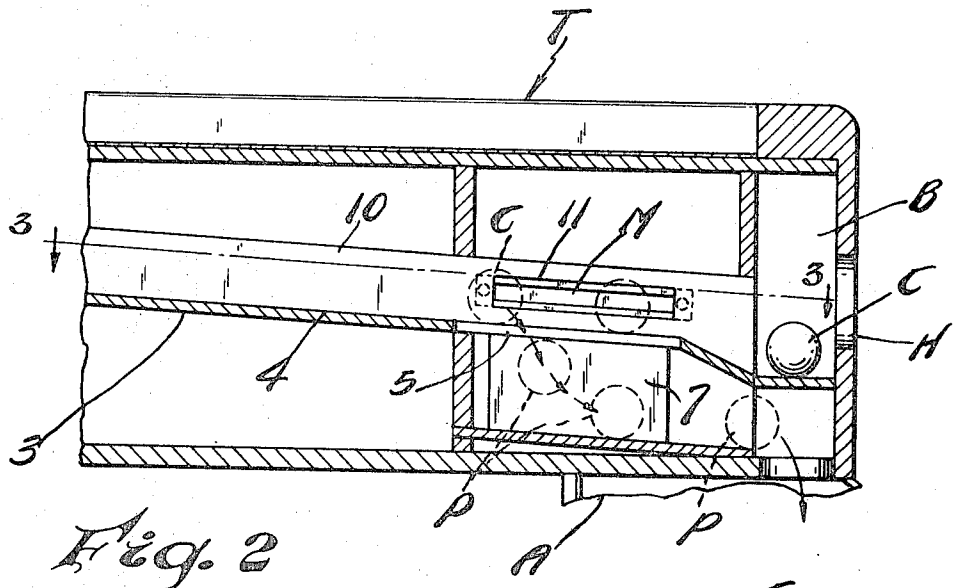


Fig. 2

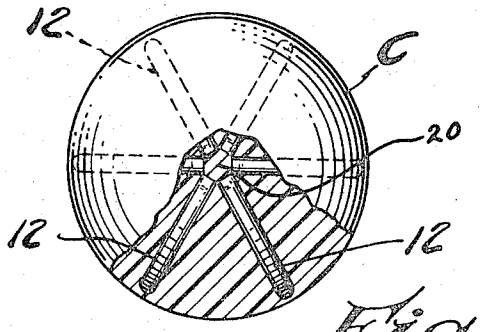


Fig. 5

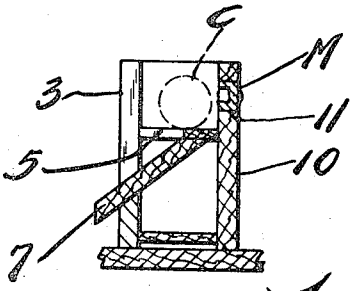


Fig. 4

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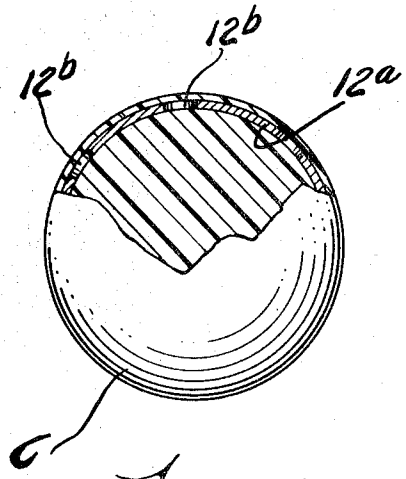


Fig. 6

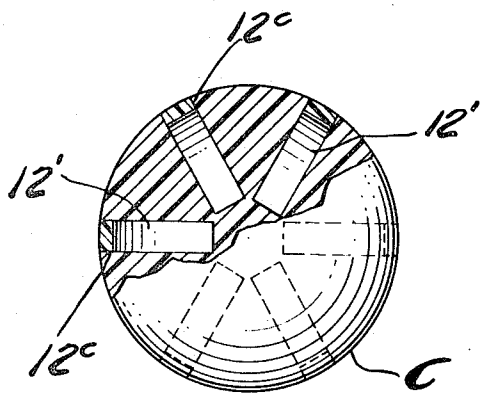


Fig. 7

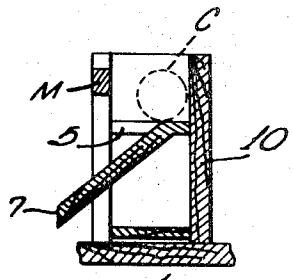


Fig. 10

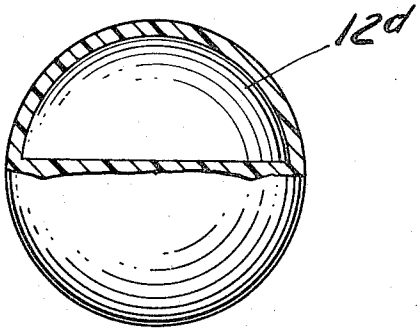


Fig. 8

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POOL BALLS SEPARABLE BY MAGNETIC FORCES

This application is a division of application Ser. No. 207,694 filed Jul. 5, 1962, now U.S. Pat. No. 3,362,710 issued Jan. 9, 1968.

This invention relates to pool balls used on tables, particularly tables equipped with a normally locked, coin actuated pool ball compartment into which the balls roll, by gravity, when played, and to means for effecting magnetic separation of the unnumbered cue ball from the numbered object balls in the event the cue ball inadvertently is shot or rolls into one of the pockets during the progress of the game.

Most coin operated pool tables have distributor troughs leading from the individual pockets of the table to a normally locked object ball compartment which can be opened only upon the depositing of a coin of the proper denomination. It frequently happens that the cue ball is shot or rolls into one of the pockets of the table and thus would be subjected to the same treatment as the other balls if provision were not made to prevent the cue ball from being delivered to the object ball compartment. This problem has been solved heretofore by so forming the cue ball that it has a slightly larger diameter than the object balls, i.e., there is a size differential between the cue ball and the object balls, so that when the cue ball is inadvertently shot or rolls into one of the table pockets it is incapable of entering the locked object ball compartment. Instead, the oversize ball bypasses the object ball compartment and is delivered to a cue ball compartment, thereby making it unnecessary to insert a coin in the mechanism to retrieve the cue ball prior to completion of the game.

Although an oversize cue ball permits its separation from the other balls, there are many objections to utilizing a cue ball that is larger than the remaining balls. One of the salient objects of the invention, therefore, is to provide means for enabling the cue ball to be made the same size as the object balls and still enable the cue ball to be separated automatically from the object balls.

With the above and other objects in view, the present invention consists in the combination and arrangement of parts, hereinafter more fully described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportion and minor details of construction, without departing from the spirit, or sacrificing any of the advantages of the invention.

IN THE DRAWINGS

FIG. 1 is a top plan view of a pool table constructed according to the invention with the playing surface of the table broken away to show the ball chutes and distributing trough, the broken lines showing a cue ball and object balls;

FIG. 2 is an enlarged, fragmentary, longitudinal sectional view through the distributor trough and cue ball compartment taken on the line 2–2 of FIG. 1;

FIG. 3 is a sectional plan view taken on line 3–3 of FIG. 2;

FIG. 4 is a transverse, sectional view through the distributor, taken on the line 4–4 of FIG. 3;

FIG. 5 is an enlarged, elevational view of a cue ball formed according to one embodiment of the invention, with a part broken away to show the construction;

FIGS. 6—8 are views similar to FIG. 5, but illustrating other embodiments;

FIG. 9 is an enlarged, fragmentary perspective view of the magnet; and

FIG. 10 is a view similar to FIG. 4, but illustrating a modification.

Apparatus constructed according to the invention comprises a complement of pool balls including a plurality of numbered object balls P and one unnumbered cue ball C, the balls being adapted for use with a substantially conventional pool table T. The table has underslung ball chutes 1 communicating with each pocket 2, each chute 1 terminating at a lower

level, downwardly inclined trough 3 leading to a normally locked object ball compartment A into which the object balls P may roll by gravity. The trough 3 also leads to a cue ball compartment B into which the cue ball C may roll when the game is completed, or when it is inadvertently shot into a pocket during the progress of the game. The cue ball compartment is provided with an access opening H to permit the ball to be removed from the compartment B when desired.

The cue and object balls preferably are formed of phenolic resins of the type disclosed in U.S. Pat. Nos. 2,223,394 or 2,395,675, but any other suitable and conventional material having the desired characteristics, as hereinafter set forth, may be utilized.

As is best shown in FIGS. 2, 3 and 4, the trough 3 has a bottom wall or floor 4 having a width somewhat greater than the diameter of the balls. In advance of the cue ball compartment B, a portion of the floor 4 is removed to form an exit opening 5 beneath which is mounted a deflector plate 7 that is adapted to deflect a falling ball into a chamber 8 that communicates with the compartment A through an opening 9. Adjacent the opening 5 the floor 4 has a width such that any ball arriving at the opening will be diverted through the latter by gravity unless it is acted upon by an external force.

The cue ball C is formed to the same diameter as the object balls and follows the same path to the exit opening 5 whenever it is inadvertently shot or rolls into one of the pockets 2 of the table. To eliminate the possibility of the cue ball's rolling through the exit opening 5 and following the path of travel of the object balls, one side wall 10 of the distributor trough is slotted as at 11 for substantially the full length of the opening 5 to accommodate an elongated magnet M of known construction, for a purpose presently to be described.

The magnet M is adapted to attract and guide the cue ball past the exit opening 5, so that it bypasses the locked compartment A and continues to roll down the trough 4 into the cue ball compartment. For this purpose, the cue ball is equipped with internal, magnetically attractive material so that it will be attracted by the magnet M as it rolls past the exit opening.

The cue ball can be formed in various ways and, when completed, preferably is of the same weight and diameter as the object balls P. Moreover, the magnetically attractive material must be so distributed that the center of mass of the ball coincides with the geometric center of the ball, as shown at 20 in FIG. 5, so as to permit the ball to roll true when played.

In one embodiment, the resin forming the ball C is molded about a plurality of uniformly spaced apart, stainless steel strips 12 in the form of circular of semicircular loops. The molding process can be any one of a number of conventional embedding processes as long as each strip or loop is embedded in the body of the ball so that they all are completely covered by the resin material of which the ball is formed and as long as the strips are evenly spaced so that the center of mass of the ball is at the geometric center of the ball. Alternatively (FIG. 6), a hollow sphere 12*a* of metal may be embedded in the ball by a molding process and the sphere can be perforated as at 12*b* to allow the plastic resin to flow into the sphere to form a core within the sphere. An alternative method (FIG. 7) is to mold a ball with peripheral grooves 12*c* in its outer surface, the depth of the grooves being greater than the thickness of the strips 12. Thereafter the strips 12', which may be identical to the strips 12 described above, may be inserted in the grooves and the grooves filled to the outer surface of the ball with the resin which subsequently may be cured to form a smooth exterior. A still further method (FIG. 8) is to substitute for the loops 12 segment shaped pieces of metal 12*d* similar to orange sections and either mold the ball around such sections, or insert them in a ball having grooves therein to accommodate them, and subsequently fill the grooves with resin and cure the latter to form a smooth surface.

In all of the foregoing embodiments, it is desirable that the metal in the ball extend as close as possible to the surface of the ball to assure adequate attraction of the ball by the magnet

M. Accordingly, it is necessary that the resin used in forming the ball be of adhering to the metal and remaining adhered thereto. Moreover, the resin should be sufficiently tough to avoid cracking in the regions adjacent the metal.

If desired, the exposed face of the magnet M can be concave in cross section to provide for a greater area of contact with the ball. The strength of the attraction between the cue ball and the magnet should be sufficient to maintain the ball against the sidewall **11** of the trough, but it should not be of such magnitude as to prevent the ball from rolling past the exit opening **5**, thus assuring its reaching the cue ball compartment B.

In any of the described embodiments, the metal embedded in cue ball C can be magnetized. In such an arrangement, the magnet M can be replaced by a strip of magnetically attractive material such as steel. It should be understood that the terms "magnetic means" refers interchangeably to magnets, magnetized material or nonmagnetized magnetizable material.

If it should be desired to repel, rather than attract the cue ball, the metal in the ball can be so arranged that its magnetic polarity is the same as the polarity of the magnet M. This construction would require mounting the magnet M on the trough wall that is opposite the wall **11**, as is shown in FIG. **9**.

In practice, the player first inserts a coin (not shown) in a coin slide lever **16** (FIG. **1**) and pushes the lever inwardly to actuate mechanism (not shown) to unlock the ball compartment A. The complement of object balls and the cue ball then may be assembled on the playing surface of the table and a game begun. Any object ball P that rolls into a pocket **2** will be delivered to the locked compartment A, from which it cannot be retrieved until another coin is deposited. Should the cue ball C be shot into a pocket, however, it will be forcibly attracted by the magnet M so as to prevent its being diverted to the locked compartment A. Instead, the cue ball will bypass the exit opening **5** and will be delivered to the compartment B where it may be retrieved and put in play.

The disclosed apparatus constitute presently preferred embodiments of the invention, but this disclosure is intended to be illustrative rather than definitive of the invention. The invention is defined in the claims.

We claim:

1. A complement of spherical, uniform size pool balls comprising: a plurality of object balls and a cue ball; either said plurality of object balls or said cue ball being nonmagnetic, and the other of said plurality of object balls and cue ball being magnetic and including a spherical body of nonmagnetic material and magnetic means embedded in said nonmagnetic material radially outwardly of a portion of said nonmagnetic material and wholly radially inwardly of the outer surface of said nonmagnetic material for permitting the separation of said cue ball from said object a balls by magnetic forces, said body having its center of mass located at its geometric center.

2. The complement of balls set forth in claim **1** wherein said magnetic means is adjacent the outer surface of said nonmagnetic material.

3. The complement of balls set forth in claim **1** wherein said other of said balls is said cue ball and said magnetic means comprises magnetically attractive material.

4. The complement of balls set forth in claim **3** wherein said magnetic means comprises a plurality of individual, curved equally circumferentially spaced, strips of metal with ends adjacent common polar locations.

5. The complement of balls as set forth in claim **4** wherein said strips of metal comprise strips of nonmagnetized magnetizable material.

6. The complement of balls set forth in claim **3** wherein said magnetic means comprises a hollow sphere of metal.

7. The complement of balls set forth in claim **6** wherein said sphere is perforated.

8. The complement of balls set forth in claim **3** wherein said magnetic means comprises a plurality of segment-shaped pieces of metal.

9. The complement of balls as set forth in claim **1** wherein said nonmagnetic material engages substantially the entire surface of said magnetic means to completely envelop said magnetic means.