Aug. 17, 1965 J. J. PALOVIK 3,201,128

PITCHING DISC OPTIONALLY CAPABLE OF STICKING OR SLIDING

Filed March 18, 1963

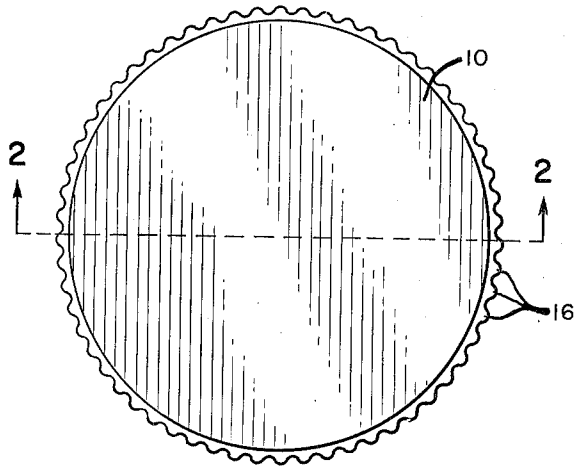


FIG. - 1

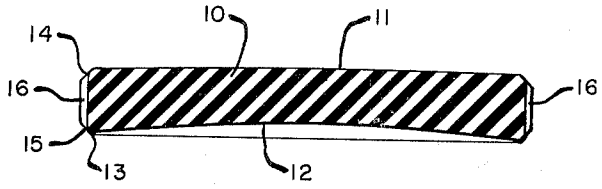


FIG. - 2

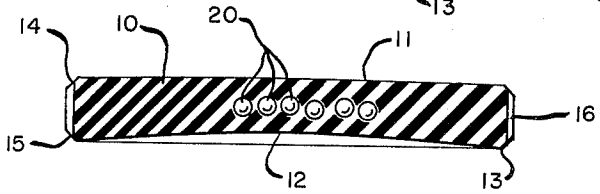


FIG. - 3

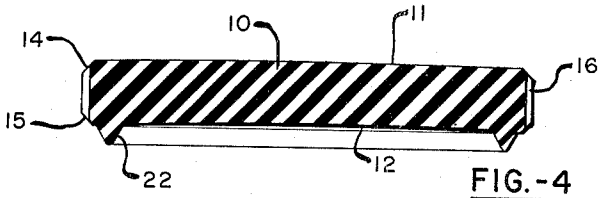


FIG. - 4

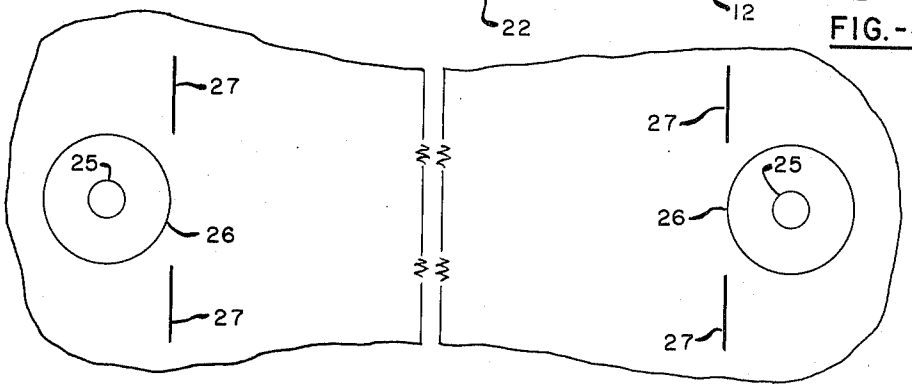


FIG. - 5

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PITCHING DISC OPTIONALLY CAPABLE OF STICKING OR SLIDING

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This invention relates to games and is directed particularly to a competitive tossing or pitching game of the nature of horseshoes or quoits. More specifically, the invention is directed to a novel pitching disc for use in such games, which offers a number of choices in game strategy in its use, as well as providing a substantial degree of control over its action or effect at the target area.

Pitching games as exemplified by horseshoes have long been popular, it is believed, in part because they offer competition in skills which can be developed or improved by practice, and in part because they can be enjoyed by players of widely varying ages and with little or no skill or opportunity for practice. Horseshoes in particular, however, generally require a certain minimum clear area out of doors, or specially equipped courts indoors. At times, also, surrounding objects, or players or spectators may be in danger of being struck and injured by a shoe inaccurately thrown or rebounding unexpectedly.

It is accordingly a primary object of my invention to provide, for use in a pitching game, a novel pitching disc which is simple, inexpensive, and completely non-hazardous for use either in or out of doors or in confined spaces, which game retains the high degree of competitive appeal and challenge to skill that characterizes horseshoes. Another object is to provide a novel pitching disc giving, at the choice and control of the player using it, two different and distinct effects upon impact in the target area. Still other and further objects and advantages of the invention will become apparent as the description proceeds.

Briefly stated, the foregoing and other objects are accomplished in accordance with my invention, by a disc which is of a size, shape, and weight to be conveniently grasped and thrown or tossed, preferably with a spinning motion which stabilizes its attitude in flight and upon impact. It is formed of a flexible, resilient material such as rubber, with one side of the disc being very nearly flat or slightly convex, while the other side is hollowed out or concave so that only a thin smooth lip or ring around the disc periphery will make contact with a flat surface.

The different shapes of the two sides cause quite different effects when the disc strikes the target area, depending upon which side is down. Upon impact on the flat or convex side, the disc tends to slide forward in the direction thrown. Thus, if thrown with sufficient skill and accuracy, it may dislodge a previously thrown opponent's disc from the target area. When pitched to make impact with the hollow or concave side down, however, the disc will slide forward very little if any distance at all. In fact, if skillfully thrown, it not only stops short or sticks at the point of impact, but if the target surface is quite smooth, the disc may be made to adhere to it with a slight vacuum. This is created by a downward inertial flexing of the disc center when the peripheral lip or ring strikes the target surface, followed by an upward rebound toward the unflexed position. Depending on the degree of adhesion, the disc may or may not be easily driven off the target area by the impact of a disc subsequently thrown.

According to a modification of the invention, weight may be added near the center of the disc to increase the inertia of this portion and make it easier to obtain vacuum adhesion. This should be done, however, in such a way as not substantially to reduce the disc flexibility or affect its balance for throwing.

This will be better understood from the detailed description which follows, taken with the accompanying drawings forming a part of this application and showing typical embodiments of my invention and how it may be used. In these drawings,

FIGURE 1 is a plan view of a disc which is the preferred embodiment of the invention;

FIGURE 2 is a cross-section view of the disc of FIGURE 1 along the line 2—2;

FIGURE 3 is a cross section, similar to FIGURE 2, of a modified form of disc;

FIGURE 4 is a cross section, similar to FIGURE 2, of a further modification of the disc; and

FIGURE 5 is a plan view of a typical playing area and targets used with the disc of FIGURES 1–4.

Referring now to these drawings in detail, and particularly to FIGURES 1 and 2, a disc **10** which is the preferred embodiment of my invention is formed of flexible, solid rubber, with a diameter to thickness ratio of between five and ten, for example, about seven. It is of a size and weight that is convenient and easy to grasp and toss, typically between three and four inches in diameter; but it could be substantially larger or smaller if desired for any reason. The upper surface **11** of disc **10** is flat or slightly convex, the center being perhaps 1/32 inch higher than the edges. The lower surface **12** is hollow or concave starting substantially from the edge of the disc, leaving a thin smooth peripheral ring **13** capable of making essentially line contact with a flat surface. The concavity in the center of the disc **10** is typically about 1/8 inch. Preferably the upper and lower corners of the cylindrical disc edge are beveled as shown at **14** and **15**, and the outer periphery is knurled or fluted with rounded shallow projections **16**. The valleys between adjacent projections **16**, however, remain on bevels **14** and **15** and do not intersect ring **13**.

In use, the disc **10** is ordinarily grasped between the thumb and second finger, with the first finger lying along the disc edge against projections **16**. When it is then pitched with an underhand arm swing, and released in a horizontal attitude by letting it roll off the first finger, it acquires, about a vertical axis perpendicular to the plane of the disc, a spin which stabilizes it in flight.

If it is pitched in this way with convex or flat side **11** down, to make impact in front of the target area, sliding forward along the playing surface for an appreciable distance toward the target generally occurs. If the disc is pitched with concave side **12** down, however, it normally stops almost instantly at the point of impact. In fact, with a sufficiently smooth playing surface, a player can sometimes create a small vacuum in the concavity of side **12**, due to the inertial downward flexing of the unsupported center of the disc, upon edge **13** making substantially simultaneous contact with the playing surface all around the disc periphery. It is the force of the flexed disc seeking to return to its unflexed condition that creates the vacuum, provided edge **13** can make a good seal against the target surface.

In FIGURE 3 is shown a modified form of the disc **10**, which has increased sticking ability. Weight is added in the center of the disc in such a way as not to interfere with its overall balance or flexibility or to change its shape. For example, metal pellets or balls **20**, such as lead or steel shot, spaced apart so as not to affect the disc flexibility appreciably, are placed in the center interior of the disc when it is being formed, as by molding it of rubber under heat and pressure. In this position the added weight by its inertia increases the downward flexing of the center of the disc during impact of the rim **13** against the surface of the target; and it thus increases the likelihood of obtaining a vacuum in the enclosed space formed by contact between the rim **13** and the target sur-

face, when the disc center tries to rise and return to its unflexed position.

In FIGURE 4 is shown a further modification of the disc **10** wherein the main body portion has generally parallel upper and lower surfaces, and the effect of concavity of the side **12** is provided by an axially projecting lip or edge **22** extending around the disc periphery. As compared with rim **13**, edge **22** may be somewhat more flexible and resilient, while still maintaining a relatively small area of contact with a flat target surface, even after some wear by abrasion has occurred during use. Edge **22** should not be so thin and flexible, however, as to be torn or damaged in normal use. Added weight **20** may be included as in FIGURE 3, or omitted as in FIGURE 2, as may be desired.

In FIGURE 5 is shown in plan view a typical arrangement of a pitching court using two targets spaced a suitable distance apart. The preferred form of target has two concentric circles, an inner circle **25** and an outer circle **26**. For better visibility the space between circles **25** and **26** may be a color contrasting with the rest of the target area surface. A suitable diameter for inner circle **25** is about two times the disc diameter, so that it is just possible, but unlikely, for two discs in edge contact to be inside the inner circle. For outer circle **26** a suitable diameter is about six times the disc diameter; but, as is clearly apparent, many other forms and dimensions of pitching targets may be used if desired. Foul lines **27**, marking the position beside one target behind which a player must stand in pitching toward the opposite target, are convenient but not essential.

As in horseshoes and similar games, it is usual for two players to play against each other as in singles, or for four players to play as two pairs of partners in doubles. Each player has two discs to pitch toward the distant target, the discs being so marked or colored as to be easily distinguishable from the discs of his opponent(s). The player or partner with the higher score in the previous inning pitches his two discs first. The losing or tying player or partner of the previous inning pitches his two discs last. The final positions of the four discs are counted each inning for points for each player or partnership.

A disc completely inside of inner circle **25** counts the highest score, say 3 (or 5) points. A disc touching circle **25** counts an intermediate score, say 2 (or 3) points. A disc touching or inside outer circle **26** but not touching circle **25**, counts the lowest score, one point. Discs completely outside of circle **26** do not count. "Game" is an agreed number of total points, say twenty-one, and is won by the player or partners first reaching it.

It is particularly in playing according to rules like these that the form and properties of the novel disc enable the use of interesting game tactics and strategy. The player pitching first will ordinarily try to stick one or both of his discs to the target within inner circle **25** concave side down. If he does not succeed, his opponent pitching last may stick or slide one or both of his discs into the available high-scoring space. If the first player does succeed in placing one or both discs in a high-scoring position, his opponent may try to slide one or both of his discs convex side down with enough velocity to dislodge the first player's disc(s) from the target center, leaving his own in a good scoring position.

Here, one of the interesting uncertainties of the game enters, for if the first player has succeeded in getting some vacuum adhesion of one or both of his discs to the target face, then the sliding disc may rebound strongly, leaving the attached disc virtually unmoved. As the degree of vacuum adhesion may vary all the way from a negligible to a substantial amount, and it is sometimes difficult to know its extent, the results of a collision between discs are very often surprising.

A further interesting variation is for one or both of circles **25** and **26** to be a shallow groove to prevent a vacuum adhesion, so that it can occur only for discs that drop clear of the grooves.

In view of the foregoing, many other variations in game rules, forms of target, scoring, and the like will be obvious. While a thirty or forty foot separation between targets may be suitable if plenty of space is available, any lesser separation can be used in confined spaces or for young players. A single target can be used in a small space by always pitching toward it from some suitably distant position. While a great many specific details have been set forth by way of example, the scope of the invention is not to be considered as limited thereto, but it is properly to be ascertained from the appended claims.

I claim:

1. A pitching disc optionally capable of sticking or sliding on a horizontal target surface, said disc comprising a flexible, resilient, circular disc of a size and weight suitable to be grasped and thrown, having a diameter to thickness ratio of between five and ten, the edge of said disc being cylindrical so that the line of contact between two discs making an edge-to-edge impact is perpendicular to the plane of the discs, one side of said disc having a shape between flatness and a convexity of about $\frac{1}{32}$ inch so as to slide without tendency to overturn, and the other side of said disc being concave substantially to the disc edge so as to leave a thin flexible peripheral rim capable of making contact with a flat surface along a continuous circular line.

2. A pitching disc as in claim **1** having a plurality of dense metallic weighting particles within the interior of the center portion of said disc sufficient to increase the inertia of said portion substantially, said particles being spaced apart within the material of said disc so as not substantially to reduce the disc flexibility.

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