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IMPROVED TAKRAW BALL

This invention relates to an improved takraw ball manufactured from plastics material. Takraw is a game originating in Thailand but played generally throughout South East Asia and the game essentially comprises
5 opposing teams on either side of a chest high net, the players being allowed to use their feet, knees, elbows, shoulders, foreheads, or other parts of their bodies except hands. The most important rule in playing takraw is that players must pass the takraw ball back
10 and forth among them without letting it touch the ground.

Like balls for football, basketball etc., the takraw ball is spherical in shape. However, what distinguishes a takraw ball from other balls are the method by which it is manufactured and the way it looks. A takraw ball
15 is made by interweaving rattan strips to produce a spherical ball, so it looks like a small spherical basket, which is the literal meaning of "takraw" in Thai. A Thai takraw ball is unique in that it has twenty interweaving cross-overs and twelve corresponding apertures.

20 A traditional rattan takraw ball is made by first splitting rattan stalk into long strips of 3 to 4 millimetres wide and 3 to 4 millimetres thick. Then these rattan stalks are plaited spirally to form a circular band, like a spring coil of 8 to 12 turns.



The number of turns will be determined from the width of rattan strips used and the final tightness of the ball required. Newly plaited or woven rattan takraw balls are not round and have to be pressed by big tongs to force the rattan strips to squeeze into each other and form a round ball. It is then treated with coconut oil to prolong storage life.

The quality of a rattan takraw ball depends on rattan quality and the weaving method. Different types and ages of rattan naturally cause wide variation in quality. Tremendous efforts have been spent to control quality by careful selection of rattan, splitting uniform size of strips etc. However, a wide range of quality of rattan takraw ball does exist. Final balls are then subjected to classification again according to their final appearance and quality. This causes difficulties in cost and quality control in the manufacturing process. Rattan takraw balls therefore have a wide range of prices, though their respective real costs are practically the same. Appearance alone is not sufficient for consumers to make a cost effective decision when buying a takraw ball. Last but not least, the innate property of a rattan takraw ball which refrains beginners from playing takraw, is the hardness of a new takraw ball. It causes pain to players.



It must be massaged or in use for some time before it becomes softer. Once it is soft, then this is the signal that it is about time to discard the ball as it will soon lose its resilience and bounce.

5 Takraw balls woven from strips of plastics material joined at their ends into hoops have been proposed. However, such plastic takraw balls have problems concerning roundness, asymmetry of surface curvature all over the ball and an unreasonably short life when
10 used. These are hindrances to players, that is to say, players cannot, or find it difficult to, control the ball in kicking it to the spot or direction required. This is due to the asymmetry of roundness of the ball, together with the edges of the strips from which the
15 ball is woven having a fin effect on the surface of the takraw ball. This fin effect retards the flow or movement of the ball, because there are more surfaces which increase their resistance. In other words, when it is windy the air current passing through the fins of the ball
20 would affect the direction of flight of the ball and the increase in air resistance slows the air speed of the ball when it has been kicked. Thus, the asymmetrical roundness or surface curvature of this type of plastics takraw ball hinders both the general and the expert
25 player. Moreover, this type of takraw ball has the



problem of the hoops easily becoming loose due to detachment of the strip end joints, which are usually made by the use of a pin which can easily loosen on impact of the ball in all directions whilst it is being played.

It is an object of the present invention to provide an improved takraw ball of greater roundness and surface uniformity.

According to the present invention, a takraw ball comprises bands woven into a spherical basket, wherein hoops, each consisting of an elongate, generally flat strip of plastics material having one convex side edge of constant radius, the other side edge of sinusoidal undulating profile and joined at its ends into a frusto-conical shape, having a planar base and a sinusoidal top, are paired into bands, with the hoop's bases in a common plane and the peaks and troughs of the hoop's sinusoidal tops relatively staggered; so that the bands can be interwoven with the troughs intersecting at cross-overs.

The frusto-conic hoops, being arranged back-to-back, conform more to a spherical shape and the sinusoidal troughs permit bands to interweave more tightly at cross-overs.

In an embodiment of the present invention, each pair of frusto-conic hoops is separated by an additional hoop, consisting of an elongate, narrow, flat and parallel-sided strip of plastics material, the additional strip being inserted between the bases of paired, frusto-conic hoops and then joined at its ends; thereby to force apart the frusto-



conic hoops and tighten the weave of the ball.

In a further embodiment, the outer face of each strip forming a frusto-conic hoop is chamfered to one side of each sinusoidal trough, to accommodate an overlying interwoven band at a cross-over. Similarly, the sinusoidal side edge of each frusto-conic strip may be notched to one side of each trough, to accommodate, at a cross-over, the additional hoop centrally disposed of an overlying interwoven band.

The radius of curvature of the convex side edge of each frusto-conic strip is proportionate to the circumference of the takraw ball and the width of the additional strip.

A Thai takraw ball consists of six circular bands interwoven to a spherical basket having twenty cross-overs.

In accordance with the present invention and for a Thai takraw ball, the sinusoidal top of each strip forming a frusto-conic hoop has five equi-distanced peaks and troughs. The outer faces of the strips may be grooved to lend elasticity to the plastics strip material and to control the weight of the ball. Each strip forming a frusto-conic hoop may have a tooth at one end to engage a hole located proximate the other end of the strip in a depression in the outer face thereof, the depression being shaped to accommodate the toothed end of the strip and form a flush-surface joint. Preferably, each strip is riveted at its ends.

The inner face of each strip may be grooved or plain and the thickness of the strips may be additionally used to control the weight of the ball.

The above and other features of the present invention are



illustrated by way of example in the drawings wherein:-

Fig. 1 shows a Thai takraw ball in accordance with the present invention;

Figs. 2, 3 and 4 are, respectively, a plan, a side elevation and an underplan of a side strip;

Figs. 5 and 6 are respectively, a plan and an underplan of a central strip;

Fig. 7 is a perspective view of an assembled band; and,

Fig. 8 is a detail showing a cross-over.

As shown by Fig. 1, a Thai takraw ball consists of six bands 1 woven into a spherical basket. Each band consists of a pair of side hoops 2 separated by a central hoop 3.

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A side hoop is shown by Figs. 2, 3 and 4 to be formed from an elongate, generally flat strip 4 moulded of suitable plastics material, such as polypropylene or high density polyethylene, to have a convex side edge 5 of constant radius and the other side edge of sinusoidally undulating profile having five equispaced peaks 6 and intervening troughs 7. The upper face 8 of each strip has a chamfered region 9 to one side of each trough; the chamfered region tapering towards the strip edge and towards the trough, where it ends in an abrupt step 10. Each trough is also asymmetric, with a notch 11 to one side thereof. The remainder of the upper face 8 is moulded with a series of intermittent, generally longitudinal grooves 12.

One end of the strip tapers to a point from which depends a tooth 13 whilst the other end has a hole 14 located in a depression 15 in the upper strip 8; the depression 15 being shaped to accommodate the tooth end of the strip when the tooth 13 is inserted into the hole 14 and leave a flush upper surface to the hoop joint. Rivet holes 16 and 17 are respectively provided proximate each end of the strip.

A central hoop 3 is shown by Figs. 5 and 6 to be formed from an elongate, narrow strip 18 moulded from suitable plastics material to have straight side edges



19 and 20, a longitudinally grooved upper face 21, a plain underface 22 and rivet holes 23 and 24 respectively, proximate each end.

5 An assembled band I is shown by Fig. 7 to consist of a central hoop 3, formed from a central strip with its ends overlapped and rivetted together and two side hoops 2 each formed from a side strip with a tooth 13 inserted into the receiving hole and the overlapped, flush-surfaced ends permanently joined
10 together by rivets 25. As can be seen, the troughs 7 of one side strip are offset relative to the troughs 7 of the other side strip.

As is shown more clearly by Fig. 8, three bands I, II and III are interwoven at a cross-over 26. The
15 troughs 7 of meeting side hoops of bands I, II and III come together at a single point and it is the meeting troughs in the edges of the side hoops that permit a relatively smooth intersection at this point. Band II is partially broken away to show how the band overlies
20 the chamfered region 9 of a side hoop 2 of underlying band I at an adjacent cross-over 27. Additionally, it is shown how a notch 11 in side hoop 2 accommodates the overlying central hoop 3 of band II. Both these features contribute towards forming a smoother, more
25 general spherical profile to the cross-overs.



An additional feature of the notches 11 is that they permit, during construction of a ball, a rivet for an underlying central hoop 3 to pass the edge of an overlying side hoop 2; rivetted hoop being rotated until
5 the rivetted joint is hidden under another band.

The weight and size of the takraw balls depend upon the type of sport. For example, for Sepak Takraw the ball weight is fixed at between 160 and 180 grammes and for "Takraw going through the hoops" the weight is fixed
10 at between 180 and 200 grammes. The circumference of an international standard takraw ball is between 40.64 and 43.18 centimetres (16" to 17"). The radius of curvature of the side edge 4 ranges from 500 millimetres to 3000 millimetres and the radius of the sinusoidally
15 undulating side edge of 5 peaks each effectively being an arc of radius between 100 and 200 millimetres.

In a takraw ball constructed as described, the overlying interwoven hoops at a cross-over point can be specified to have a distance between the cross-over
20 point and the middle of any of the three adjacent centre hoops of between 10 and 15 millimetres.



CLAIMS:

1. A takraw ball comprising bands woven into a spherical basket, wherein hoops, each consisting of an elongate, generally flat strip of plastics material having one convex side edge of constant radius, the other side edge of sinusoidal undulating profile and joined at its ends into a frusto-conic shape, having a planar base and a sinusoidal top, are paired into bands, with the hoop's bases in a common plane and the peaks and troughs of the hoop's sinusoidal tops relatively staggered; so that the bands can be interwoven with the troughs intersecting at cross-overs.
2. A takraw ball as claimed in claim 1 wherein, each pair of frusto-conic hoops is separated by an additional hoop, consisting of an elongate, narrow, flat and parallel-sided strip of plastics material, the additional strip being inserted between the bases of paired, frusto-conic hoops and then joined at its ends; thereby to force apart the frusto-conic hoops and tighten the weave of the ball.
3. A takraw ball as claimed in claim 2, wherein the outer face of each strip forming a frusto-conic hoop is chamfered to one side of each sinusoidal trough, to accomodate an overlying interwoven band at a cross-over.
4. A takraw ball as claimed in claim 2 or claim 3, wherein the sinusoidal side edge of each strip forming a frusto-conic hoop is notched to one side of each trough, to accomodate,

at a cross-over, the additional hoop centrally disposed of an overlying interwoven band.

5. A takraw ball as claimed in any of claims 1 to 4, wherein the outer face of each strip is provided with longitudinal grooving to control the elasticity of the strips and the weight of the ball.
6. A takraw ball as claimed in any of claims 1 to 5, wherein each strip forming a frusto-conic strip has, at one end, a tooth shaped to engage a hole located proximate the other end of the strip in a depression in the outer face of thereof, the depression being shaped to accomodate the toothed end of the strip and form a flush-surface joint.
7. A takraw ball as claimed in any of the preceding claims and comprising six bands woven into a spherical basket having twenty cross-overs, wherefor the sinusoidal top of each each strip forming a frusto-conic hoop has five equispaced peaks and troughs.
8. A takraw bell substantially as described with reference to or as shown by the Drawings.



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