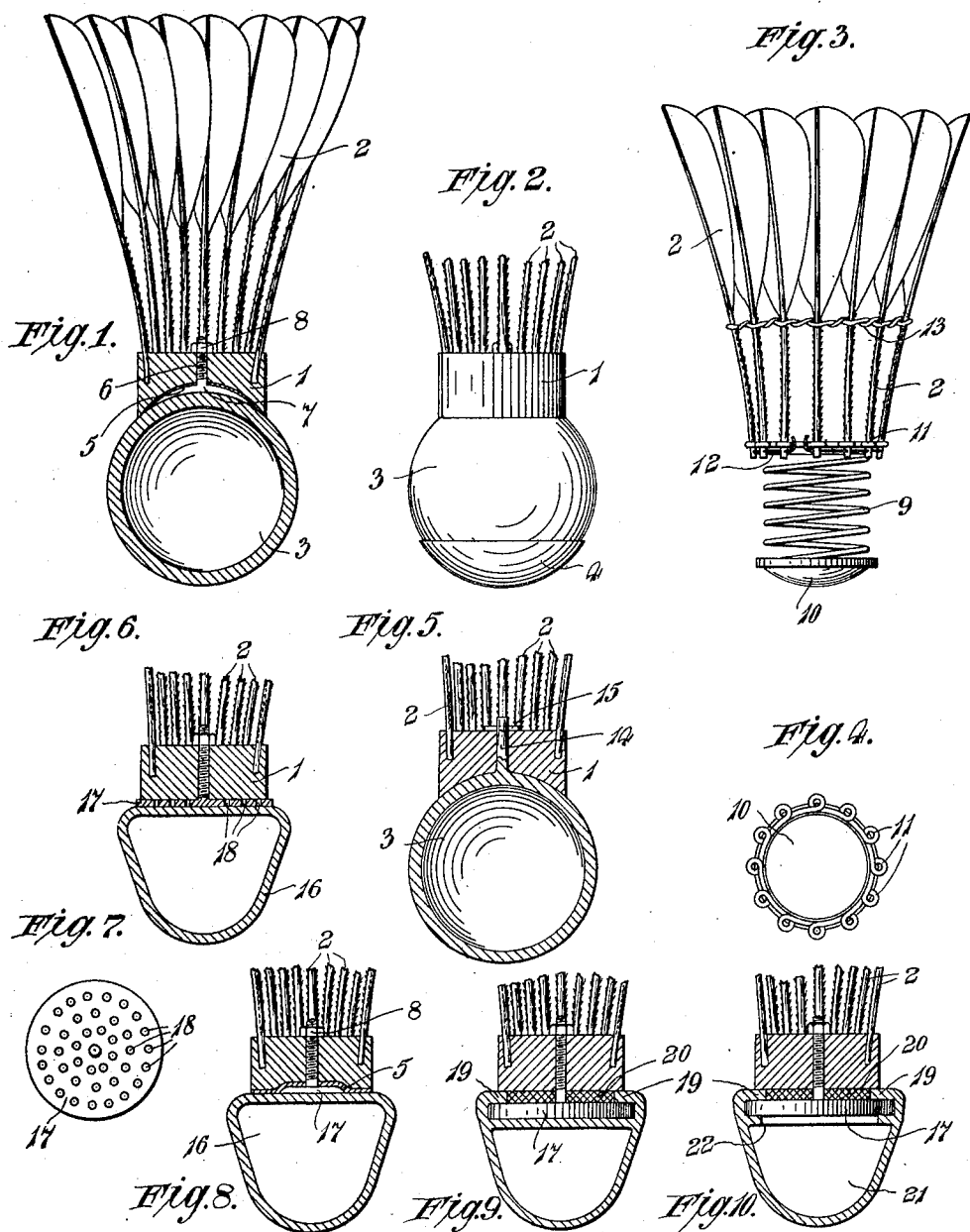


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SHUTTLECOCK DEVICE FOR USE IN GAMES.
APPLICATION FILED OCT. 23, 1919.

1,393,407.

Patented Oct. 11, 1921.



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SHUTTLECOCK DEVICE FOR USE IN GAMES.

1,393,407.

Specification of Letters Patent.

Patented Oct. 11, 1921.

Application filed October 23, 1919. Serial No. 332,790.

To all whom it may concern:

Be it known that I, FRED TENNEY, of 26 Buckingham road, Doncaster, England, a subject of the King of England, have invented new and useful Improvements in Shuttlecock Devices for Use in Games; and I do hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates to shuttlecock devices for use in connection with games wherein the device is adapted to be struck through the air by a player by means of his hand, or with the aid of a suitable striking implement.

The usual shuttlecock device commonly used in games such as badminton, or children's games such as battledore and shuttlecock, comprises a cork base adapted to be struck by the player, and a retarding or flight steadying device formed by a conical structure of feathers mounted on the said base, and the essential characteristic of the device thus formed is that it is very light, and bounces very little, if any, upon touching the ground, the object in either of the two games hereinbefore mentioned being to keep the shuttlecock in play in the air without touching the ground.

In another form of shuttlecock device for use in games wherein the object is to be kept in play after bouncing on a table, or on the ground, the base is provided with a more resilient member, formed by a spring, or by an india rubber cushion, or by a completely inclosed pneumatic cushion or ball, as an india rubber ball.

In using either of the hereinbefore described devices it has been found that continued use results in depreciation of the resilient member so that it no longer possesses the desired degree of resiliency and becomes practically useless for further play, especially in the case of the secondly hereinbefore described device. One of the objects of the present invention is to provide improved constructions of shuttlecock which will enable the resilient base part of the device to be readily attached to or detached from the retarding, or steadying part of the device, so that it may readily be replaced when desired by a new resilient base part.

Similarly the invention enables the retarding or flight steadying part of the device to be readily replaced should that part be fractured or become in any way unserviceable—as is often the case when feathers

are used—the resilient base part being meanwhile in good serviceable condition, thus tending toward economy when extensive use is made of such objects as when playing badminton and kindred games, as that forming the subject matter of my concurrent application, Serial No. 332,791 filed Oct. 23, 1919.

In order that my invention may be clearly understood and carried into effect I have appended hereto one sheet of the drawings, illustrating the same, wherein:—

Figure 1 is a vertical cross section of one construction of shuttlecock device comprising a detachable india rubber pneumatic ball.

Fig. 2 is a side elevation of a similar construction of device comprising a celluloid pneumatic ball.

Fig. 3 is an elevation of a device comprising a detachable spiral spring resilient member.

Fig. 4 is a plan view of the base portion of the device shown in Fig. 3.

Fig. 5 is a sectional view of another construction comprising a detachable pneumatic ball.

Fig. 6 is a sectional view of a construction of device wherein the resilient part is in the form of a conical pneumatic cushion, and

Fig. 7 is a plan view of the connecting means according to Fig. 6.

Figs. 8 and 9 are sectional views illustrating other alternative constructions wherein the resilient part is formed by a conical pneumatic cushion, and

Fig. 10 is a sectional view illustrating a construction wherein the resilient part is formed by a cup shaped india rubber cushion.

In the construction shown in Figs. 1 and 2, and 5 to 8 inclusive the base portion 1, which may be formed of wood, or cork, or any other suitable material, is provided with feathers 2 which serve to retard, or steady, the flight of the object through the air. The feathers may also if desired be suitably connected together by wire higher up their stems in a manner similar to that shown in Fig. 3.

In the constructions shown in Figs. 1, 2 and 5 the under side of the base portion is made concave, or cup shaped, and thereby adapted to receive the surface of a ball 3, which may be of india rubber as in Fig. 1, or of celluloid as in Fig. 2.

In order to prevent cracking of the celluloid ball at the point where it normally bounces, or is normally struck, an india rubber covering, or pad, 4 may be suitably secured thereto by an adhesive, as indicated in Fig. 2. The effect of this covering is to distribute the shock of impact over a larger area of the surface of the ball, celluloid being of a somewhat brittle nature and liable to split after long use if no such covering is provided.

As shown in Fig. 1 the ball 3 has secured to it by means of the washer 5 of rubber or other suitable material, a screw 6 formed or provided with a broad concave head 7 adapted to fit the contour of the ball. By means of this screw the ball may be secured when desired to the base portion 1 which is correspondingly bored, and if desired screw threaded. A nut 8 serves to hold the two parts securely together if the hole in the base part 1 is not screw threaded, but is preferably also provided for additional security even if the base part 1 has a screw thread connection with the screw 6. In this manner when the ball loses its resiliency, or becomes worn out, it may be readily replaced by a fresh ball similarly provided with a screw 6.

In the construction shown in Figs. 3 and 4 the resilient member is formed by the spiral spring 9, the lower end of which is attached to a wooden, or metal, cap 10, which takes the shock of impact with the ground, or with the striking implement. The upper end of the spring is provided with a plurality of wire loops or eyes 11, adapted to receive the ends of the feathers 2. The ends of the feathers being tapered they can be wedged securely into the eyes, although if desired additional security may be obtained by threading a wire 12 through the projecting ends of the feathers in the manner shown. The upper parts of the feathers are maintained in their correct relative positions by suitable wiring 13, and when desired the set of feathers may be bodily removed from the eyes 11 for attachment to a different spring member.

According to the construction shown in Fig. 5 the ball 3 is provided, or is integrally formed, with a plain projecting part 14 corresponding to the screw 6 and it is secured to the base portion 1, by means of a pin, or the like, 15 passed through a hole in the upper end of the projecting part 14, and engaging against the upper surface of the base part 1.

In the construction shown in Fig. 6 the resilient part is formed by a conical pneumatic cushion 16, of india rubber, or the like. This is detachably connected to the base portion 1 by means of a flat disk 17 of light material, as aluminium, or vulcanite, having a projecting screw or pin corre-

sponding to that of the constructions shown in Figs. 1, 2 and 5. The disk 17 is permanently secured to the upper flat surface of the cushion 16 by means of a suitable adhesive, and to secure a more efficient adhesion the disk may be formed with a plurality of perforations 18 to facilitate the evaporation of the volatile constituents of the adhesive employed. The cushion thus provided with connecting means is adapted for being detachably connected to the base part 1 in a manner similar to that hereinbefore described with reference to Figs. 1, 2 and 5.

In the construction shown in Fig. 8 the flat disk 17 is of smaller diameter than the upper surface of the cushion 16, and is adapted to be secured thereto by means of a rubber washer 5 in a manner similar to that described with reference to Fig. 1. In this construction, and also in the construction according to Fig. 1, the washer 5 may be formed with perforations for a purpose similar to that described with reference to Figs. 6 and 7.

In the construction shown in Fig. 9, which is a modification of that described with reference to Fig. 6, the upper edge of the cushion 16 is formed with an annular rim 19 which is adapted to be bent over the edge of the disk 17 and secured to the upper surface thereof by means of a suitable adhesive for the purpose of giving additional security of attachment of the disk 17 to the cushion 16. A suitable packing disk 20, of cardboard or other suitable material, is also provided between the surface of the disk 17 and the lower surface of the base portion 1.

In the construction shown in Fig. 10 the resilient base part is formed by a cup shaped india rubber or like cushion 21, the disk 17 forming the closure for its upper surface. For the purpose of securely attaching the disk 17, the cushion is formed with an inwardly projecting ridge or flange 22, upon which the disk 17 is adapted to rest and to be secured by an adhesive. For additional security the annular rim 19 is also provided to be bent over the edge of the disk and to be secured to the upper surface thereof in a manner similar to that described with reference to Fig. 9.

The improved devices according to my invention may be used in any suitable game, but it is particularly adapted for use in connection with the game forming the subject matter of my concurrent application for Letters Patent No. 332,791.

The celluloid ball and spiral spring forms of my invention are more particularly adapted for use in indoor games such as are generally played on tables, but they may of course be used in suitable outdoor games if desired.

What I claim is:—

1. A shuttlecock device for use in games, 130

comprising a flight steadying device, a resilient base part, and means permanently carried by said resilient base part and adapted to enable said base part to be detachably secured to said flight steadying device.

2. A shuttlecock device for use in games, comprising a flight steadying device, a resilient base part, connecting means permanently carried by said resilient base part, and cooperating connecting means carried by said flight steadying device, both said connecting means being adapted to afford a readily detachable connection between said base part and said flight steadying device.

3. A shuttlecock device for use in games, comprising a flight steadying device, a non-resilient base part to which said flight steadying device is permanently secured, a resilient base part, and means permanently carried by said resilient base part and adapted to enable it to be detachably secured to said non-resilient base part.

4. A shuttlecock device for use in games, comprising a flight steadying device, a non-resilient base part to which said flight steadying device is permanently secured, a resilient base part, a male connecting element permanently carried by said resilient base part, and a cooperating female connecting element carried by said non-resilient base part, both said connecting elements being adapted to afford a readily detachable connection between said resilient, and non-resilient base part.

5. A shuttlecock device for use in games, comprising a flight steadying device, a non-resilient base part to which said flight steadying device is permanently secured, a resilient base part, a male connecting element permanently carried by said resilient base part, a cooperating female connecting element carried by said non-resilient base part, both said connecting elements being adapted to afford a readily detachable connection between said resilient and non-resilient base parts, and removable means adapted to maintain engagement between said male and female elements.

6. A shuttlecock device for use in games, comprising a flight steadying device, a non-resilient base part to which said flight steadying device is permanently secured, a resilient base part, a screw member permanently carried by said resilient base part, a hole in said non-resilient base part adapted to receive said screw, and a nut member adapted to cooperate with said non-resilient base part and said screw to prevent disengagement thereof from said hole.

7. A shuttlecock device for use in games, comprising a flight steadying device, a non-resilient base part to which said flight steadying device is permanently secured, a completely inclosed pneumatic cushion, and means permanently carried by said cushion

and adapted to enable it to be detachably secured to said non-resilient base part.

8. A shuttlecock device for use in games, comprising a flight steadying device, a non-resilient base part to which said flight steadying device is permanently secured, a completely inclosed pneumatic cushion, a male connecting element permanently carried by said pneumatic cushion, and a cooperating female element carried by said non-resilient base part, both said connecting elements being adapted to afford a readily detachable connection between said pneumatic cushion, and said non-resilient base part.

9. A shuttlecock device for use in games, comprising a flight steadying device, a non-resilient base part to which said flight steadying device is permanently secured, a completely inclosed pneumatic cushion, a male connecting element, means for attaching said connecting element permanently to said cushion, and a cooperating female element carried by said non-resilient base part, both said connecting elements being adapted to afford a readily detachable connection between said pneumatic cushion, and said non-resilient base part.

10. A shuttlecock device for use in games, comprising a flight steadying device, a non-resilient base part to which said flight steadying device is permanently secured, a resilient base part, a male connecting element, means for attaching said connecting element permanently to said resilient base part, and a cooperating female connecting element carried by said non-resilient base part, both said connecting elements being adapted to afford a readily detachable connection between said resilient, and non-resilient base parts.

11. A flight steadying device permanently secured to a non-resilient base, said base having a hole therethrough adapted to receive a male connecting element permanently provided on a resilient member, to form a shuttlecock for use in games.

12. A resilient member having a male connecting element thereon whereby it is adapted to be detachably secured to a flight steadying device to form a shuttlecock for use in games.

13. A shuttlecock device for use in games, comprising a flight steadying device, a non-resilient base part to which said flight steadying device is permanently secured, a completely inclosed celluloid pneumatic cushion, and means permanently carried by said cushion and adapted to enable it to be detachably secured to said non-resilient base part.

14. A shuttlecock device for use in games, comprising a flight steadying device, a non-resilient base part to which said flight steadying device is permanently secured, a

resilient base part, a disk having a male connecting element thereon and adapted to be secured permanently to said resilient base part, and a cooperating female connecting element carried by said non-resilient base part, both said connecting elements being adapted to afford a readily detachable connection between said resilient, and non-resilient base parts.

- 10 15. A shuttlecock device for use in games, comprising a flight steadying device, a non-resilient base part to which said flight
15 a male connecting element thereon and adapted to be secured permanently to said resilient base part, and a cooperating female connecting element carried by said non-resilient base part, both said connecting elements being adapted to afford a readily detachable connection between said resilient, and non-resilient base parts.

16. A shuttlecock device for use in games, comprising a flight steadying device, a non-resilient base part to which said flight
25 steadying device is permanently secured, a resilient base part, a disk having a male connecting element thereon and adapted to be secured permanently to said resilient base
30 part, an annular lip on said resilient base part adapted to engage over the edge of said disk and to be adhesively secured thereto, and a cooperating female connecting element carried by said non-resilient base part, both said connecting elements being adapted
35 to afford a readily detachable connection between said resilient, and non-resilient base parts.

In testimony whereof I affix my signature in presence of two witnesses.

FRED TENNEY.

Witnesses:

ERNEST W. PETTIFER,
REGINALD PETTIFER.