

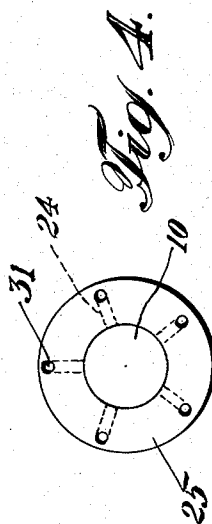
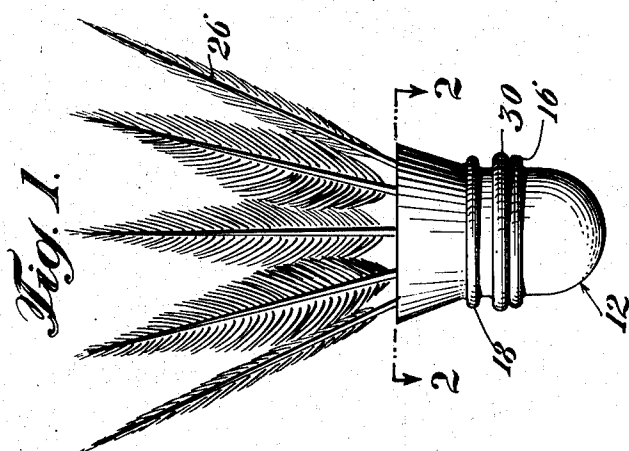
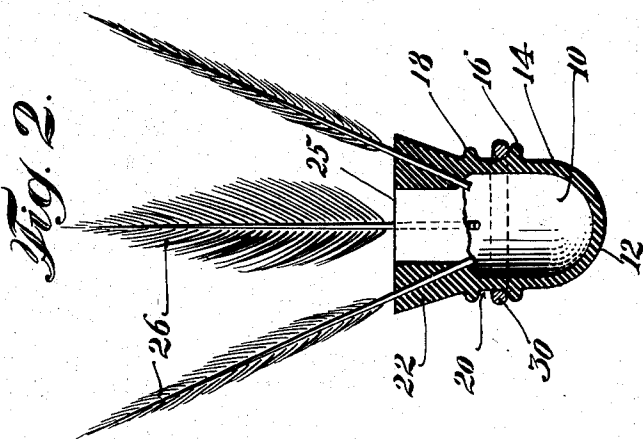
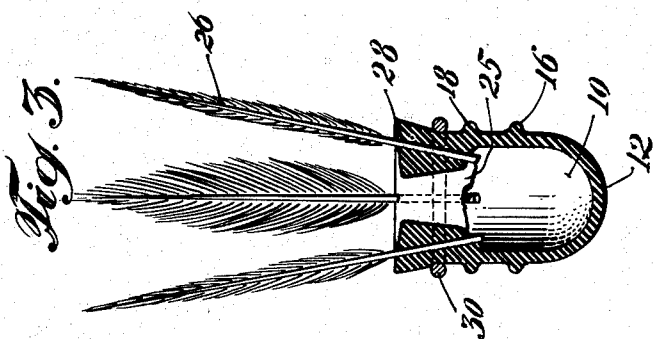
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RUBBER SHUTTLECOCK

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RUBBER SHUTTLECOCK

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3 Claims. (Cl. 273-106)

This invention relates to shuttlecock devices such as are used in the play of games known as badminton, battledore and the like, wherein the device is struck through the air by a player by means of a suitable striking implement.

Shuttlecock devices heretofore used in the play of such games have been provided with solid or completely enclosed frames, upon which a plurality of feathers are arranged and which frames are comparatively complex in structure, comparatively heavy and which because of their complex structure comprise a plurality of structural elements.

My invention contemplates the provision of an open ended hollow shuttlecock device, provided with a resilient and contractible feather retainer arranged on the shuttlecock frame, adjacent its open end. Such construction simplifies the structure of the device, enables ready assembly of the feathers on the shuttlecock frame and easy replacement thereof in the event of feather breakage. Such construction further enables inexpensive fabrication of the device and ready assembly thereof.

Feathers are provided on such devices which react on the air to thereby provide a means of steadying and directing the flight of the device through the air.

The speed of travel of the shuttlecock devices through the air and the distance travelled there-through, when struck by a player, is dependent upon the angular displacement of the feathers relatively to the shuttlecock frame. The greater the angle of divergence that the feathers make with the frame, the slower will be its flight through the air and the shorter will be its distance of travel upon being struck with a bat or racket by the players, since the wind resistance on the feathers is proportional to the said angle of divergence.

In shuttlecock devices heretofore used the angular relation of the feathers to the base has been fixed and could not be selectively adjusted and, therefore, the speed and distance traveled by such shuttlecocks through the air, under the urging of the players, could not be selectively adjusted or changed.

My invention contemplates the provision of a shuttlecock, which is so arranged and which is provided with means for disposing the flight influencing feathers associated therewith at any selected angle whereby the speed of flight of and effective distance traveled by the shuttlecock may be selectively adjusted and varied as desired by the players.

My invention further contemplates the provision of such a shuttlecock which is simple in structure, inexpensive to manufacture and assemble and which may be readily produced in large quantities without the necessity of complicated or expensive machinery.

Further objects of my invention will be clear from the description which follows and from the drawing in which

Fig. 1 is a plan view of a shuttlecock constructed in accordance with my invention and showing the feathers disposed at a selected angle to the frame of the device.

Fig. 2 is a cross section taken on the line 2-2 of Figure 1.

Fig. 3 is a cross section taken along the line 2-2 of Figure 1, but with the feathers arranged at a differently selected angle to the frame of the device.

Fig. 4 is a top plan view of the shuttlecock frame and base portion.

In that practical embodiment of my invention which I have illustrated in the drawing, I provide a hollow open ended frame fabricated from any suitable resilient material such as rubber.

The lower part of the frame is provided with the preferably semi-spheroidal base portion 12, which is that part of the shuttlecock struck by the players in the play of the game with the conventional bat or racket.

Upstanding from the base portion, I provide the annular wall 14 which has arranged on its outer surface the annular ribs 16 and 18 together forming the encircling ring retaining channel 20. Arranged on the annular wall is the preferably inverted frusto-conically shaped feather retaining shoulder 22 having a heavier cross section than that of the annular wall from which it extends. Peripherally arranged in this shoulder and disposed therein divergently of the vertical axis of the frame are provided the feather retaining channels 24, which with the shoulder together provide the feather gripping collars 26.

It will be apparent that I have provided a simple, integral frame comprising only a single element which may be readily and inexpensively fabricated in one operation, as by casting in a suitable mold of conventional design, which need not be described or illustrated in detail here.

The feathers 26 which are of the conventional type are provided with the stems 28 which are inserted in the apertures of the feather receiving channels and thereby disposed around the circumference of the feather retaining shoulder.

der, the channels being somewhat smaller in diameter than the stems to thereby cause the gripping collars to frictionally grasp the feather stems.

5 The feather stems are preferably of sufficient length to extend completely through the channels into the hollow inner portion of the frame to thereby provide a cohesive, firm structure.

10 Since the channels are divergently arranged in the shoulder; the feathers will assume an angular position relatively to the frame of the device. By providing the shoulder with a heavier cross section than that of the wall, it will be apparent that a much stronger structure is
15 thereby provided, which is highly desirable, since these devices are subjected to great strain and wear upon being vigorously struck with a bat or racket.

20 It will be apparent that the hollow frame will provide an extremely resilient body portion and one which is not unnecessarily heavy.

It will be further apparent that the annular wall and the shoulders are thereby made contractible and may be forced inwardly to thereby
25 vary the angular displacement of the feather retaining channels relatively to the shuttlecock frame.

In order to provide means for selectively contracting and thereby varying the angular displacement of the channels and the feathers arranged therein, I provide the encircling band or
30 ring 30 formed from any suitable material such as wire, rubber or the like and which is normally arranged in the encircling ring retaining channel
35 formed by the annular ribs arranged on the wall of the frame.

Referring now to Figure 2, the encircling ring is normally arranged adjacent the lower annular wall 16. It will be apparent that the position of
40 this ring in the retaining channel may be selectively raised upwardly toward the upper annular rib 18. Such adjustment of the ring will only slightly vary the angular disposition of the feathers, since the contractual effect on the wall is
45 comparatively small.

It will be further apparent, however, that this annular ring may be moved above the upper rib onto the conically shaped shoulder into the posi-

tion shown in Figure 3. In this position the ring will materially urge the shoulder to contract inwardly to thereby materially and effectively change the angular disposition of the feathers, thereby decreasing the air resistance on the
5 feathers in the flight of the device through the air. It will be at once apparent that the angular position of these feathers relatively to the frame may be selectively adjusted to thereby provide means for selectively varying the speed of travel
10 of and the effective distance traveled by the device through the air.

It will be at once apparent that I have provided a novel shuttlecock having means for selectively adjusting the position of the wind resisting feathers arranged thereon. It will be further apparent
15 that I have provided an extremely resilient shuttlecock, simple in structure, comprising only a single frame element, and which may be inexpensively fabricated in large quantities.
20

I claim:

1. A shuttlecock device comprising a resilient hollow open ended frame, a contractible shoulder arranged thereon, a feather retaining shoulder
25 arranged on the frame, a plurality of feathers extending divergently from the shoulder and an encircling ring adjustably arranged on the frame, the divergence of said feathers to the shoulder adapted to be selectively changed upon the adjustment of said ring.
30

2. A shuttlecock device comprising a hollow open ended frame, a contractible shoulder arranged on the frame, flight influencing means arranged on the shoulder and means on the frame
35 for adjustably contracting the said shoulder whereby the flight influencing means are selectively positioned relatively to the frame.

3. A shuttlecock device comprising a hollow open ended frame, a contractible shoulder arranged adjacent the open end of the frame, a
40 plurality of flight influencing feathers arranged on the shoulder and extending divergently thereof and means adjustably arranged on the frame for changing the extended position of said feathers relative to the frame whereby the speed of flight
45 of the shuttlecock device through the air may be varied.

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