

[54] SHUTTLECOCK OR BUTTERFLY
 ADJUSTABLE IN RANGE AND SPEED

[76] Inventor: Kwang Chul Chung, 129-1,
 Kongduk-dong, Mapo-ku, Seoul,
 South Korea

[22] Filed: June 10, 1971

[21] Appl. No.: 151,856

[30] Foreign Application Priority Data

June 10, 1970 South Korea 6100

[52] U.S. Cl. 273/106 A

[51] Int. Cl. A63b 67/18

[58] Field of Search 273/106 A, 106.5

[56] References Cited

UNITED STATES PATENTS

2,153,251 4/1939 Hudson 273/106 A

FOREIGN PATENTS OR APPLICATIONS

814,439 6/1959 Great Britain 273/106.5 C

887,172 1/1962 Great Britain 273/106 A

435,218 9/1935 Great Britain 273/106 A

Primary Examiner—Richard C. Pinkham

Assistant Examiner—Paul E. Shapiro

Attorney—Millen, Rapses & White

[57] ABSTRACT

A shuttlecock or butterfly is provided with an arrangement in which gliding feathers are readily arrayed or rearranged, attached onto or detached from so as the shuttlecock or butterfly itself be adjusted in its flying range and speed. The arrangement comprises a plurality of pits formed along the upper brim of the bottom cup portion of the basket-like main hopper body, a rib-like skirt portion, a plurality of vertical frames and a plurality of knob heads formed on the top of the vertical frames, protruding upwardly from the upper end of the skirt portion. The feathers are secured onto along the inner surface of the vertical frames with the foot portion of the quill inserted in the pits formed along the upper brim of the bottom cup portion and the upper portion of the quill at the middle of the feather tied onto the knob heads formed on the top of the vertical frames by such fastening means as string, wire or adhesive tape.

11 Claims, 4 Drawing Figures

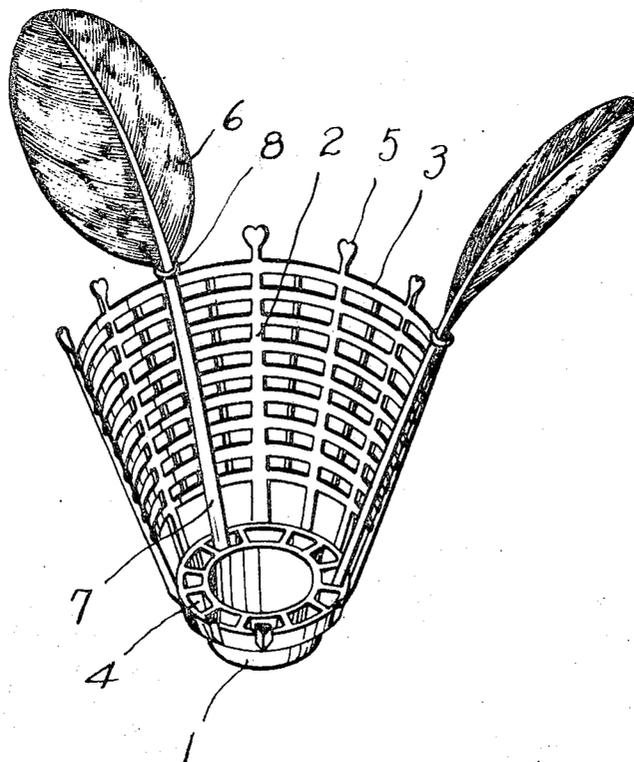


FIG. 1

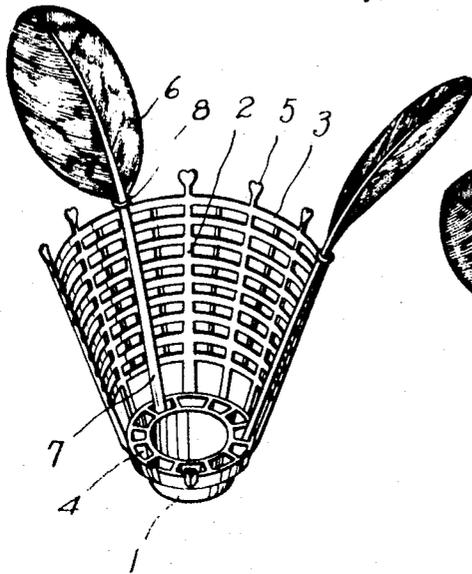


FIG. 3

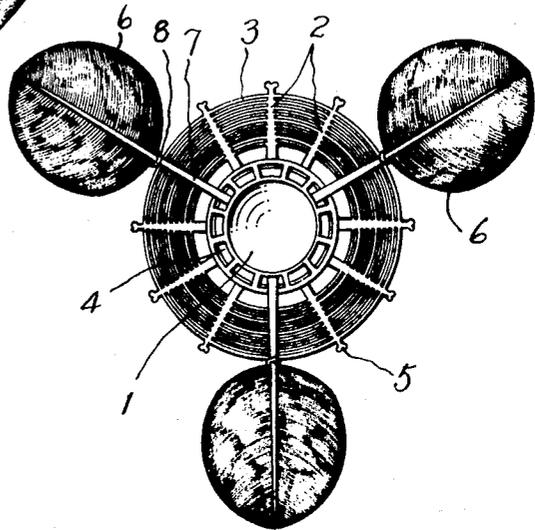


FIG. 2

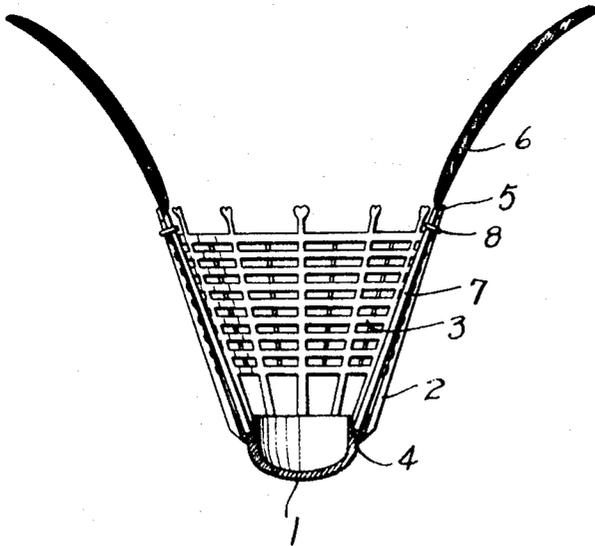
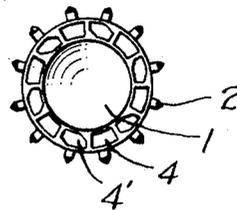


FIG. 4



INVENTOR
KWANG CHUL, CHUNG

BY *Millen, Raper & White*
ATTORNEYS

SHUTTLECOCK OR BUTTERFLY ADJUSTABLE IN RANGE AND SPEED

FIELD OF THE INVENTION

The present invention relates to shuttlecock or butterfly, particularly to ones that are adjustable in flying range and speed thereof by means of arraying feathers readily attached onto or detached from an arrangement suitably provided thereon the shuttlecock or butterfly of the invention.

In accordance with the invention, it is preferable to have shuttlecock or butterfly of thermoplastic reduced in size to be comparatively smaller than known conventional ones but robust in structure which will accordingly result in increase in flying range and speed by the virtue of lesser resistance of air it invites, and this will be checked by the arrangement of this invention, that is, the flying range and speed thereof will be cut to a certain degree desired by the means of arraying or rearranging, increasing or decreasing in the number of feathers readily attachable and detachable.

BACKGROUND OF THE INVENTION

Of some of known conventional shuttlecock or butterfly of thermoplastic, the bottom cup portion, the feathers and skirt portion thereof are integrally formed while some are in a two-piece, the main body and the bottom cup portion separately molded respectively and docked together, and neither of them is able to be adjusted of flying range and speed, and it is almost impossible for users or players thereof to play it in a limited narrow space or an extreme care should be taken in batting it, which is all unnecessary.

If, just in order to cut down the range and speed thereof, a shuttlecock is thinly provided at its skirt portion, it would be broken or torn apart in no time, and then, if, just in order to make up the weakness of above, a shuttlecock is robustly provided at its skirt portion and relatively at the bottom cup portion, it would naturally result in increase in bulk and weight, further in uncontrollable flying range and speed.

In the conventional shuttlecock or butterfly, feathers are integrally planted along the bottom cup portion, made out of botanical nut or made of plastic or synthetic rubber, and once one or some of them fell out of or badly worn out, it would fly off its course and as a whole would finally turn a good-for-nothing, just for some of the feathers damaged.

Moreover, in the conventional shuttlecock or butterfly of thermoplastic, it has heretofore been unattainable for users or players thereof to fix-up the array of features or, to attach more feathers onto or detach some of the feathers from in order to adjust the flying range and speed thereof to be adaptably fit to a certain limited playground or to the likes of players thereof.

SUMMARY OF THE INVENTION

It is therefore the prime object of the present invention to provide shuttlecock or butterfly with an arrangement wherein feathers are readily attached onto or detached from.

Another object of the invention is to provide means possible for users or players thereof to array or rearrange feathers thereof in adjusting range and speed thereof in various ways to adaptably fit to a certain playground allowed or to their likes.

In order to meet the end described above, the characteristic of the invention resides in that means are provided on an integrally formed basket-like hopper body of thermoplastic composing a bottom cup portion, vertical frames and a skirt portion so that feathers such as bird's or other treated or manufactured feathers of plastic, synthetic fibre or animal or plant fibre, are readily attached thereonto or detached therefrom, and the adjustment in flying range, speed and capability thereof is easily attained by determining the number of feathers or size of them to be attached or by determining variously the array and attached position thereof.

Further characteristic of the invention is that of the shuttlecock or butterfly, a plurality of pits in certain depth and shape is formed on along the upper brim of the bottom cup portion while on the top of the vertical frames a plurality of knob heads is formed protruding upwardly from the upper end of the skirt portion, with all the pits in a complete alignment longitudinally with corresponding knob heads respectively. And then, the feathers, with the foot portion of the quill inserted in the pits formed thereon the upper brim of the bottom cup portion, and with the upper portion of the quill at the middle of the feathers tied by such fastening means as by string, wire or adhesive tape onto the corresponding knob heads formed on the top of the vertical frames, are secured against the inner surfaces of the vertical frames, so as to be capable of adjusting the flying range and speed thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing constitutes the principal objects of this invention and other objects and advantages will become more apparent to those skilled in the art from the following description when viewed in conjunction with the accompanying drawings, wherein like parts throughout the several figures thereof are indicated by like numerals, and wherein:

FIG. 1 is a perspective view cut open of one embodiment of the present invention;

FIG. 2 is a longitudinal cross-sectional view of the shuttlecock or butterfly shown in FIG. 1;

FIG. 3 is a plane view of the same shown in FIG. 1; and

FIG. 4 is a plane view illustrating specifically slant pits formed on the upper brim of the bottom cup portion of the shuttlecock or butterfly of another embodiment of the present invention.

DISCUSSION OF THE INVENTION

In the one embodiment of the present invention, referring to FIGS. 1, 2 and 3, the main body of a shuttlecock or butterfly in accordance with the present invention is formed in a shape of basket-like hopper, of thermoplastic, comprising a bottom cup portion 1, a plurality of vertical frames 2, a rib-like skirt portion 3, a plurality of pits 4, 4' and a plurality of knob heads 5.

Referring now to FIG. 1 as it is best shown therein, the pits 4 in a certain depth and shape are formed thereon along the upper brim of the bottom cup portion 1, in a complete alignment longitudinally with the corresponding knob heads 5 formed thereon the top of the vertical frames 2 as also particularly shown in FIG. 3, the knob heads 5 projecting upwardly from the upper end of the hopper-like skirt portion 3 as clearly seen in FIG. 2.

Now for the gliding feathers to be mounted on, the feathers 6 properly touched as to be adaptable in adjusting the flying range and speed, the foot portion of the quill 7 of the feathers 6 is inserted therein the pit 4 formed thereon along the upper brim of the bottom cup portion 1 while the upper portion of the quill 7 at the middle of the feather 6 tied by the fastening means 8 possible such a string, wire or adhesive tape onto the knob head 5 formed thereon the top of the vertical frame 2 protruding upwardly from the upper end of the skirt portion 3, with the fan-like upper portion of the feathers 6 extending upwardly as to be gliding vane as clearly shown respectively in FIGS. 1, 2 and 3.

The feathers 6 as a whole should be attached in a proper position and at a adequate angle as to be adaptable in fitting to range and speed specifically desired.

The feathers 6 as thus secured thereonto the shuttlecock or butterfly also could be easily attached thereonto or detached therefrom, increased or decreased in the number thereof in arraying and rearraying in various ways as to be adapted to fit to the tastes or the likes of the users or players thereof in determining the flying range and speed thereof, in fitting to a certain limited playground.

While it is preferable to have the foot portion of the quill 7 secured therein the pit 4, it could also well be tied properly onto any part of the vertical frame 2 when the stem portion of the quill 7 is unusually short and the fan-like upper portion of the feather 6 has to be kept extending above the skirt portion 3.

In one other embodiment of the present invention, referring this time to FIG. 4, a plurality of slant pits 4' is formed thereon along the upper brim of the bottom cup portion 1 alternately with the ordinary pits 4, so as to hold the feathers 6 as a whole in a biased direction.

When the feathers 6 with their foot portion of the quill 7 inserted in the ordinary pits 4, are secured onto flat against the periphery of the main hopper body of the shuttlecock or butterfly as best shown in FIG. 2, it would naturally invite the most of air resistance at the fan-like portion or the face of the feathers 6 themselves owing to their flat perpendicular encounter against air, resulting in slow-down of flying speed and shortened range.

On the contrary, when the foot portion of the quill 7 is inserted therein the slant pits 4', the feathers 6 in their vertically erect positions would cock to a certain biased direction respectively and the fan-like portion or the face of the feathers 6 facing clockwise or counter-clockwise along the hopper periphery of the shuttlecock or butterfly, and this would invite lesser resistance of air, accordingly resulting in accelerated flying speed and lengthened range, and the speed of its spinning would be increased or decreased depending on the degree of the feathers 6 biasedly cocked.

In embodying the present invention, certain modifications and alterations possible at the stage of thermoplastic molding of the shuttlecock or butterfly. For instance, saving only the bottom cup portion 1 and several vertical frames 2 while eliminating at all the skirt portion 3 or saving only the uppermost end of the skirt portion 3.

And as for the pits 4, 4' for the foot portion of the quill 7 of the feathers 6 to be secured therein, they could well be provided either on inner brim or outer brim of the bottom cup portion 1.

While the feathers of birds' being the best for the optimum result in the shuttlecock or butterfly, artificial feathers suitably manufactured for this purpose made out of animal or botanical or plastic fibre or synthetic fibre or still other fibre, could also be used for this invention.

From the foregoing, it would be amply apparent that in this invention, adjustment in the flying speed and range of shuttlecock or butterfly is easily attained by simply increasing or decreasing in the number of feathers attached or by changing variously the array and positions of erection cocked or uncocked of the feathers, thereby adapting itself to the likes of players thereof and to limited playgrounds.

It should also be noted that in this invention, the feathers are easily attached onto or detached from whenever it is necessary to replace some of feathers worn out or fell out, or to increase or decrease the number of feathers attached.

When and if colours are given to the feathers, in different colours, the shuttlecock or butterfly would turn a bundle of harmonized assorted colours, of beautiful flying maneuver in the air, and its eye-catching performance and spinning speed that are clearly distinguishable with naked eyes, will provide a perfect guide for players thereof in their adjusting the flying speed and range of shuttlecock or butterfly.

From the above description, it will be obvious to those skilled in the art that various modifications and changes may be made without departing from the inventive concepts and the scope of the invention, and the invention is not to be considered limited to what is shown in the drawings annexed and described in the specification.

I, therefore, particularly point out and distinctly claim as my invention:

1. In a shuttlecock comprising a plurality of vertical frame elements terminating in a bottom cup portion having an upper brim, the improvement which comprises a plurality of independent feathers detachably secured to said shuttlecock in longitudinal alignment with said vertical frame elements to adjust the flying range, speed and maneuverability of said shuttlecock.

2. A shuttlecock according to claim 1, further comprising a rib-like skirt portion extending around the periphery of said vertical frame elements, wherein said vertical frame elements, upper brim portion and skirt portion are integrally formed thermoplastic.

3. A shuttlecock according to claim 2 wherein said feathers are artificial fibrous feathers.

4. A shuttlecock according to claim 2 wherein said independent feathers are each also detachably secured to one of said vertical frame elements.

5. A shuttlecock according to claim 4 wherein said independent feathers are detachably secured to integral knob heads which protrude on said vertical frame elements upwardly from the upper end of said skirt portion.

6. A shuttlecock according to claim 1 wherein at least a portion of said independent feathers are detachably secured to said shuttlecock in a biased direction relative to the periphery of said vertical frame elements.

7. A shuttlecock according to claim 1 wherein said independent feathers are detachably secured thereto by inserting the foot portions of the feather quills into

5

a plurality of corresponding pits formed in said upper brim.

8. In a shuttlecock comprising a plurality of vertical frame elements terminating in a bottom cup portion having an upper brim, the improvement which comprises a plurality of pits formed in the upper brim of said bottom cup portion for detachably receiving the foot portion of a feather quill in longitudinal alignment with said vertical frame elements.

9. A shuttlecock according to claim 8 wherein at least a portion of said pits are capable of holding said feather foot portion in a biased direction relative to the

6

periphery of said vertical-frame elements.

10. A shuttlecock according to claim 8 further comprising a rib-like skirt portion extending around the periphery of said vertical frame elements, wherein said vertical frame elements, upper brim portion and skirt portion are integrally formed thermoplastic.

11. A shuttlecock according to claim 10 further comprising a plurality of knob heads formed on the top of said vertical frame elements for detachably securing the stem portion of a feather quill thereto.

* * * * *

15

20

25

30

35

40

45

50

55

60

65