Jan. 15, 1963 J. P. SMOKOWSKI 3,073,556

KITE

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FIG. 1.

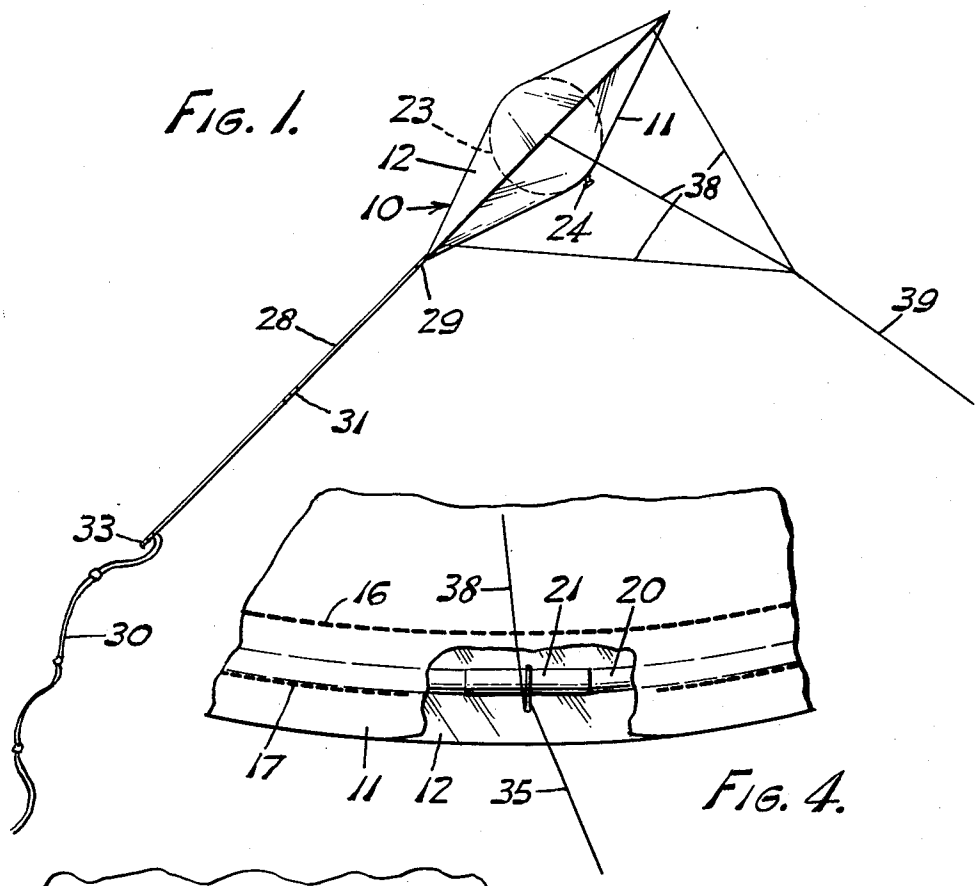


FIG. 4.

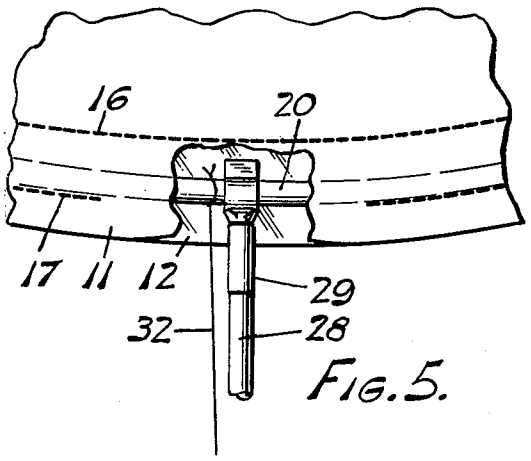


FIG. 5.

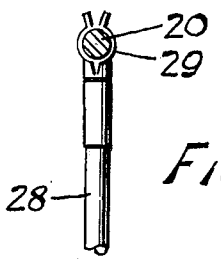


FIG. 6.

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KITE

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FIG. 2.

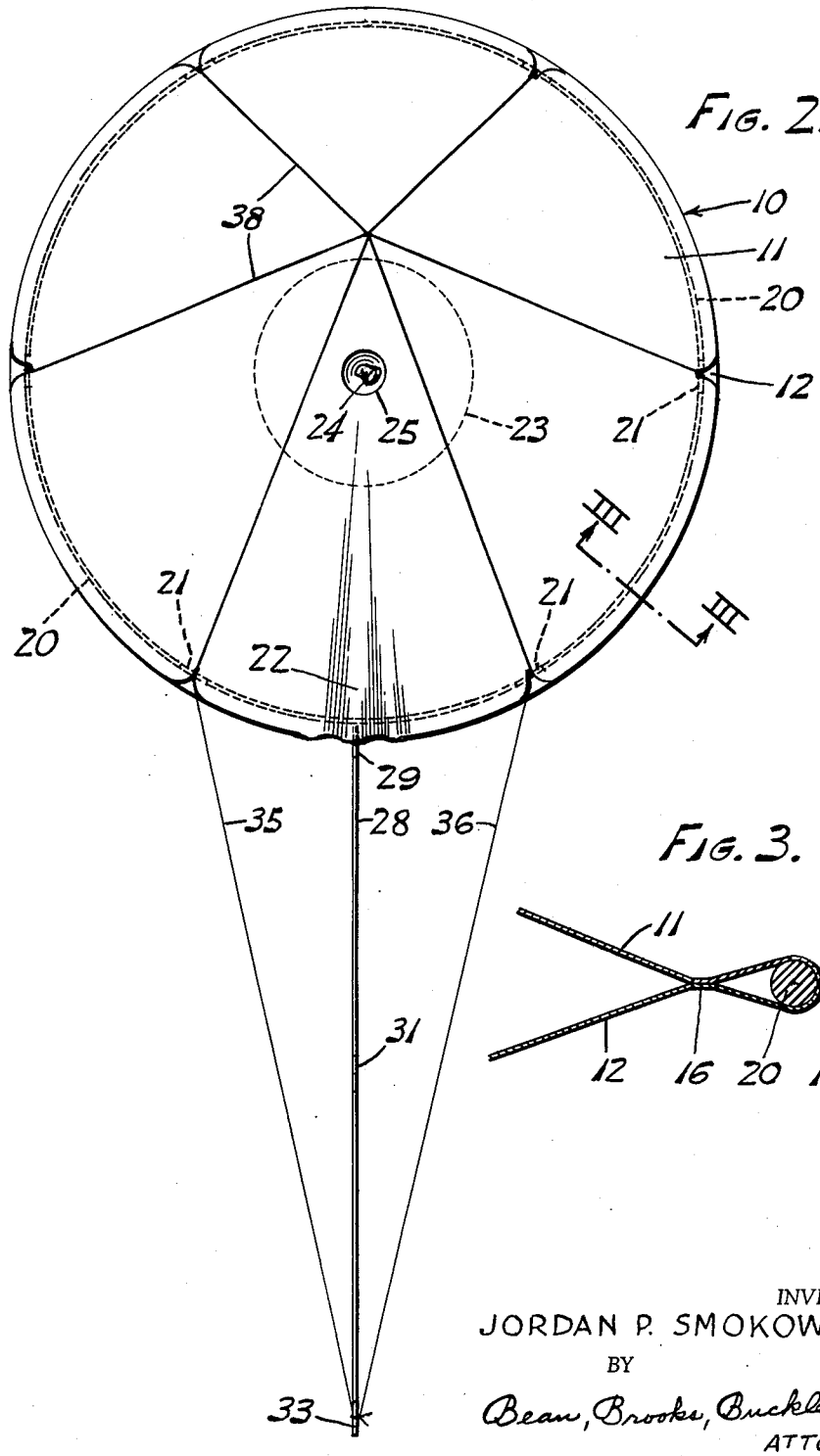


FIG. 3.

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KITE

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This invention relates to kites and particularly to a kite which may readily be erected or set up and taken down and which possesses unusual flying characteristics.

Essentially, the kite of the present invention consists of a pair of circular sheets of flexible light weight material joined about their marginal edges and provided with means for spacing the center portions of the two circular sheets when the kite is in use so as to form what may be defined geometrically as a double cone, that is, a pair of obtuse cones with their bases in juxtaposition. The joined margins of the sheets are provided with reinforcing means for maintaining the circular shape of the kite in use.

In a preferred form of the invention the sheets which form the main body of the kite are of transparent or translucent organic plastic material which may be of very light weight yet having adequate strength characteristics. Such material has reflective characteristics which render the kite unusually attractive in flight, particularly in sunlight.

The kite of the present invention is simple and economical to manufacture and can readily be set up for use. When it is in collapsed or knockdown condition the kite of the present invention is extremely compact, consisting entirely of a package about a foot long and only an inch or so across.

A most important feature of the kite of the present invention is its flying characteristics. It proves to be of remarkable aerodynamic stability and flies easily and well in a very light breeze, as well as in winds of substantial force.

A typical or representative form of the kite of the present invention is illustrated in the accompanying drawings and described in detail in the following specification by way of example. However, it is to be understood that the embodiment thus set forth is for the purpose of illustrating the principles of the present invention and the spirit and scope of the invention is not limited to such exemplary embodiment or othewise than as defined in the appended claims.

In the drawings:

FIG. 1 is a general side elevational view of one form of the kite of the present invention in flight;

FIG. 2 is a front elevation view of the kite of FIG. 1, that is, a view as seen by one flying the same, but on a larger scale;

FIG. 3 is a fragmentary cross sectional view on the line III—III of FIG. 2, on a still further enlarged scale;

FIG. 4 is a fragmentary elevational view of a marginal portion of the form of kite disclosed herein, viewed in the same direction as FIG. 2, but on an enlarged scale and with portions thereof broken away;

FIG. 5 is a fragmentary elevational view of another marginal portion of the form of kite disclosed herein, likewise viewed in the same direction as FIG. 2 but on an enlarged scale; and

FIG. 6 is a detail view of a portion of the structure illustrated in FIG. 5 but shown at right angles thereto and partly in cross section.

Like characters of reference denote like parts throughout the several figures of the drawings and the kite proper, designated generally by the numeral **10**, comprises a pair of generally circular flexible sheets **11** and **12** which are joined about their circumferences by stitching, heat sealing, by means of adhesives, or in any other desired manner. Since the form of the kite to which specific reference is had herein by way of example preferably is constructed of sheets **11** and **12** of organic plastic material, the lines of joinder therebetween are preferably effected by heat sealing the sheets to each other, suitable machines for thus joining sheets of plastic material along predetermined lines being readily available.

For reasons which will presently appear, the sheets **11** and **12** are joined, just inwardly of their peripheries, along two concentric circles. The inner line of joinder is designated **16** and is continuous about the sheets **11** and **12** whereas the outer line of joinder, designated **17**, is discontinuous in a manner and for purposes which will presently appear. Because of the scale of the drawing the lines of joinder **16** and **17** are not illustrated in FIG. 2. When heat sealing is used the lines of joinder are more or less invisible in any event. In the enlarged fragmentary views, FIGS. 4 and 5, the lines of joinder **16** and **17** are illustrated diagrammatically by dash lines.

The lines of joinder **16** and **17** form a marginal tubular opening as shown in FIG. 3 and a series of arcuate bows or stiffening members **20** of light somewhat flexible material extend along within such opening. The bows **20** may be made of various materials but I have found willow to be very effective because of its strength, light weight and low cost. In the illustrated instance the bows **20** are six in number and the outer line of joinder **17** is interrupted where the ends of the bows meet, as shown in FIG. 4. A tubular ferrule **21** is fitted more or less permanently to one end of each of the bows **20** and the adjacent end of the next bow **20** is fitted into the ferrule in setting up the kite for use.

The interruption in the line of joinder **17** at each of the ferrules **21** gives access to the ferrules **21** for purposes of assembly and disassembly. In the present embodiment there is a certain amount of slack in the two sheets **11** and **12** as indicated at **22** in FIG. 2 and this slack may be shifted about the circumference at will to facilitate getting at the ferrules **21** to assemble the bows **20**.

When the bows **20** are assembled in end-to-end fashion as indicated above, the sheets **11** and **12** are held in circular form and, in further preparation of the kite for use, the central portions of the sheets are spaced apart whereby the sheets form a pair of obtuse cones joined at their bases. Various means may be employed for accomplishing this spacing function. A very convenient and practical method, particularly in view of the importance of light weight, is to interpose a toy rubber balloon **23** in the center of the space between the sheets **11** and **12**, with the mouthpiece **24** thereof projecting through a small central opening **25** in the sheet **11**.

The balloon is deflated when the kite is in knockdown condition and by inflation thereof the sheets are held in their desired double conical relationship as clearly illustrated in FIG. 1. After inflation the mouthpiece **24** of balloon **23** may be tied off or stopped in various ways as by means of a rubber band, a paper clip, or otherwise. It is believed clear that the foregoing provides a spacing means of negligible weight yet one which bears smoothly against the central portions of the sheets **11** and **12** over a substantial area.

In addition to the interruptions referred to previously as occurring at the junctures of the bows **20**, the outer line of joinder **17** is also interrupted at the bottom dead center of the kite as viewed in FIG. 2, this portion of the margin of the kite being illustrated on an enlarged scale in FIG. 5. As shown in FIGS. 5 and 6, a tail stick **28** is provided at its upper end with a clip **29** which may be sprung into engagement over the bottom bow **20** in setting up the kite for use. A conventional stabilizing tail **30** may be tied to the bottom of tail stick **28** as shown in FIG. 1.

In the present instance, for reasons of compactness in packing, the tail stick is made in two sections joined by a ferrule **31**, the individual sections approximating the lengths of the bows **20**.

To complete the tail supporting structure, a string **32** is tied to bow **20** adjacent to clip **29** and at its other end to a ferrule **33** at the bottom of tail stick **28**, thereby preventing accidental disassembly of the tail stick sections at the ferule **31** or at clip **29**. For reasons of clarity no attempt is made to illustrate string **32** in FIG. 2. Further strings **35** and **36** tie between the bottom ferrule **33** and the ferrules **21** at opposite sides of the tail stick **28**, thus maintaining the tail stick in generally perpendicular position with respect to the body of the kite, as viewed in FIG. 2.

The kite of the present invention, as thus constructed and erected, is flown in the usual manner. Shroud lines **38** may be tied to each of the ferrules **21** and, as shown in FIG. 1, connects jointly with a tethering line or cord **39**. As initially shipped and sold the kite of the present invention is adapted to be folded into a package of small compass and the kite may readily be disassembled and folded into a similarly small package when it is not being used.

When it is desired to put the kite in knockdown or folded condition, the bows **20** are disconnected by disassembling one end of each from the ferrule **21** of the adjacent bow. The clip **29** of tail stick **28** is also withdrawn from its bow **20**. Referring to FIG. 2, the sheets **10** and **11** are then folded jointly along a horizontal line through their center, so that the top half of the kite body **10** overlies the bottom half. Following this the two sixty degree side segments of the remaining semicircle are folded in over the center sixty degree segment along radial lines.

This leaves all six of the bows **20** lying closely alongside of each other and coextensively, in the position occupied by the bottom bow **20** in FIG. 2. The two tail stick sections are then disjointed at the ferrule **31** and are laid along with the bows **20**, the latter remaining in the tubular hem portions of the sheets **11** and **12** formed by the lines of joinder **16** and **17**. Then, using the bows **20** and the tail stick sections as a sort of winding core, the segmentally folded sheets **11** and **12** are rolled thereupon by rolling upwardly from the bottom, as viewed in FIG. 2.

I claim:

1. A static kite structure comprising a pair of circular sheet members of substantially equal diameters joined to each other about their margins to define a circular kite body, means for holding the central portions of said sheet members in spaced relationship to form a kite body wherein each surface comprises a cone with both cones having a common base circle at the periphery of said kite body, and a tethering line including means engaging said kite body circumferentially to position the same with one of said cones facing generally in the direction of tethering.

2. A static kite structure comprising a pair of flexible circular sheet members of substantially equal diameters joined to each other about their margins to define a circular kite body, and an inflatable balloon disposed centrally between the sheet members and adapted upon inflation to hold the central portions of said sheet members in spaced relationship to form a kite body wherein each surface comprises a cone with both cones having a common base circle at the periphery of said kite body.

3. A static kite structure comprising a pair of flexible circular sheet members of substantially equal diameters joined to each other about their margins to define a circular kite body, semi-rigid arcuate means extending about said margins to maintain the sheet members in circular form, means for holding the central portions of said sheet members in spaced relationship to form a kite body wherein each surface comprises a cone with both cones having a common base circle at the periphery of said kite body, and a tethering line including means engaging said kite body circumferentially to position the same with one of said cones facing generally in the direction of tethering.

4. A static kite structure comprising a pair of flexible circular sheet members of substantially equal diameters joined to each other about their margins to define a circular kite body, semi-rigid means extending about said margins to maintain the sheet members in circular form, and an inflatable balloon disposed centrally between the sheet members and adapted upon inflation to hold the central portions of said sheet members in spaced relationship to form a kite body wherein each surface comprises a cone with both cones having a common base circle at the periphery of said kite body.

5. A kite structure comprising a pair of flexible circular sheet members, a pair of concentric radially spaced seams adjacent to the peripheries of said sheet members for joining the same to each other to form a circular kite body having a marginal tubular formation, a plurality of semi-rigid arcuate members in said tubular formation and connected in end-to-end relationship to maintain said sheets in circular form, and means for holding the central portions of said sheets in spaced relationship to form a kite body wherein each surface comprises a cone with both cones having a common base circle at the periphery of said kite body.

6. A kite structure comprising a pair of flexible circular sheet members, a pair of concentric radially spaced seams adjacent to the peripheries of said sheet members for joining the same to each other to form a circular kite body having a marginal tubular formation, elongated semi-rigid rod means in said tubular formation to maintain said sheets in circular form, and means for holding the central portions of said sheets in spaced relationship to form a kite body wherein each surface comprises a cone with both cones having a common base circle at the periphery of said kite body.

7. A kite structure comprising a pair of circular sheet members of substantially equal diameters joined to each other about their margins to define a circular kite body, and means for holding the central portions of said sheet members in spaced relationship to form a kite body wherein each surface comprises a cone with both cones having a common base circle at the periphery of said kite body, and tethering line means attached to said kite body at a plurality of spaced points adjacent to its periphery to position said kite body with one of said cone surfaces facing generally in the direction of tethering.

8. A static kite structure comprising a pair of circular sheet members of substantially equal diameters joined to each other about their margins to define a circular body, and means for holding the central portions of said sheet members in spaced relationship to form a kite body wherein each surface comprises a cone with both cones having a common base circle at the periphery of said kite body, a tethering line engaging said kite body circumferentially to position the same with one of said cones facing generally in the direction of tethering, and a tail stick attachable to the periphery of said kite body and extending generally perpendicularly therefrom.

9. A static kite structure comprising a pair of circular sheet members of substantially equal diameters joined to each other about their margins to define a circular kite body, means for holding the central portions of said sheet members in spaced relationship to form a kite body wherein each surface comprises a cone with both cones having a common base circle at the periphery of said kite body, tethering line means attached to said kite body at a plurality of spaced points adjacent to its periphery to position the same with one of its cones facing generally in the direction of tethering, and a tail stick attachable to the periphery of said kite body and extending generally perpendicularly therefrom.

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