

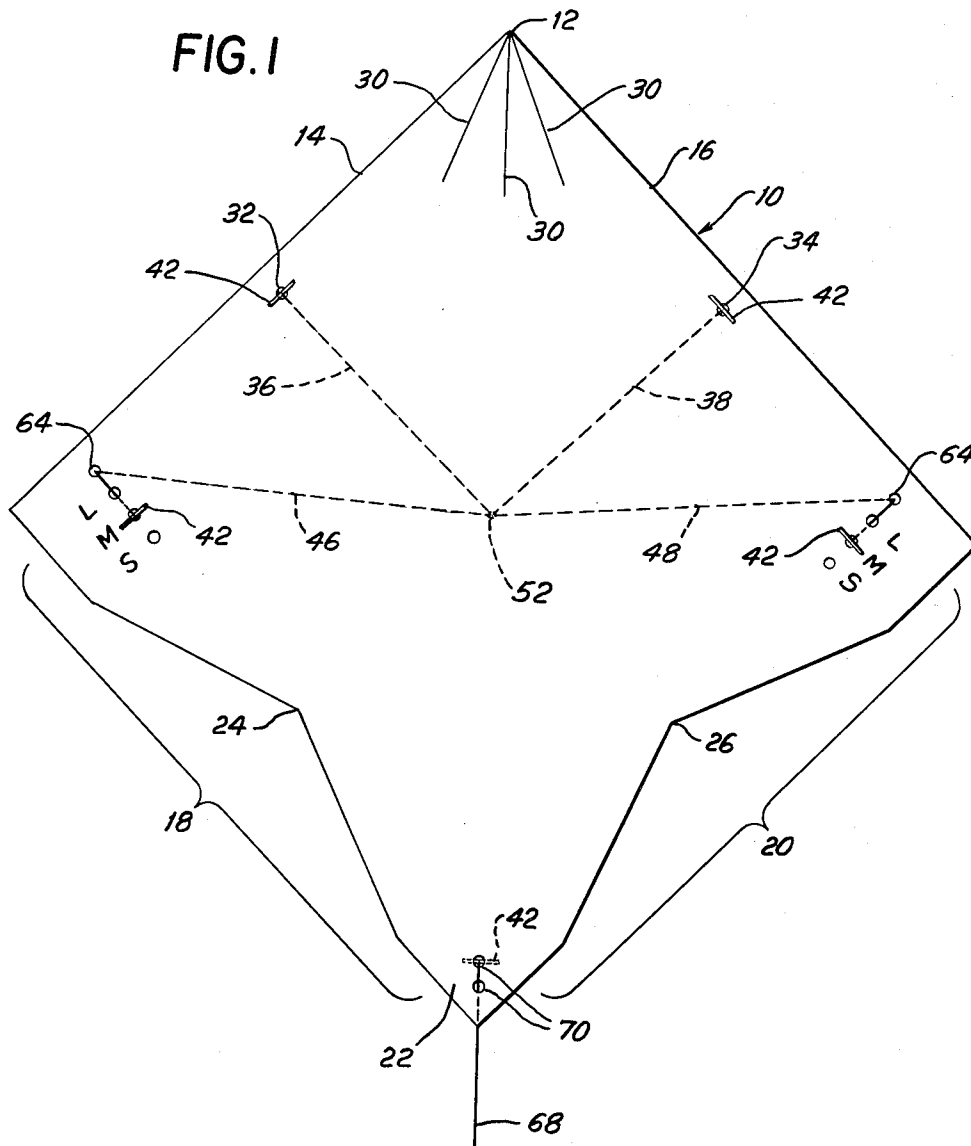
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FLEXIBLE KITE

2,751,172

Filed Nov. 17, 1952

2 Sheets-Sheet 1



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FIG. 2

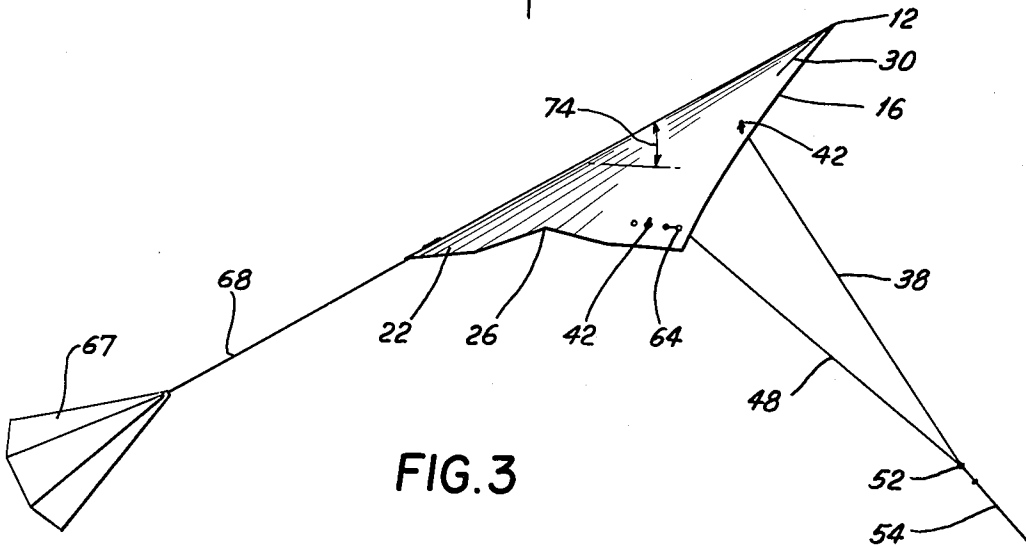
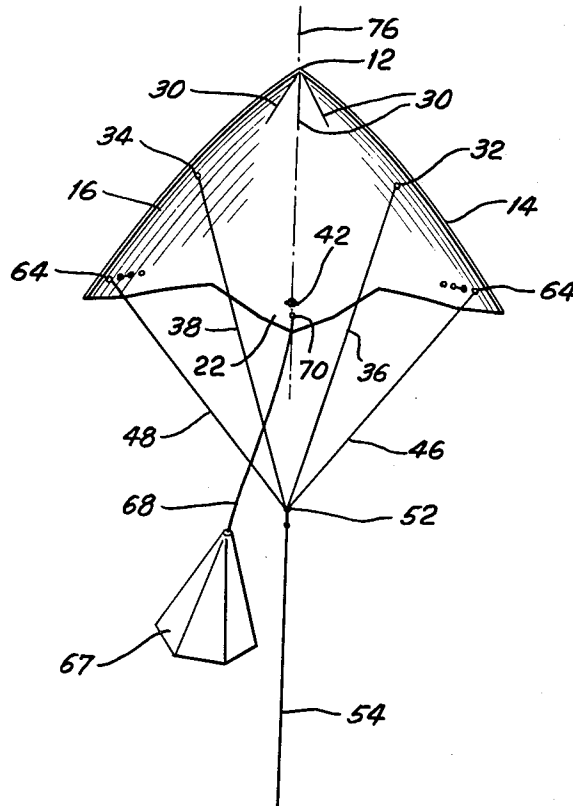


FIG. 3

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FLEXIBLE KITE

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3 Claims. (Cl. 244-153)

This invention relates to kites and more particularly to kites having no rigid structural elements, of the type set forth generally in our United States Patent 2,546,078 of March 20, 1951.

In the patent referred to hereinabove is disclosed a kite of generally quadrilateral shape and comprised of a light, flexible material having a crevice longitudinally of the kite body for strengthening and rigidifying the structure. We have now found upon further research and experimentation that it is possible to construct a kite of flexible material such as paper, cellophane, etc. wherein the kite body forms a single continuous arch angularly transverse of the oncoming wind and that such construction affords unexpected stability in flight as well as enhanced lifting power. Further, our improved construction effects easier control of the kite in flight and results in an overall simplification in manufacture and operability not hitherto suspected, as well as affording an economy in that a lighter and cheaper material is usable.

Accordingly, it is the object of our present invention to construct a completely flexible kite of a single piece of suitable material which will be exceedingly cheap to manufacture and prepare for flight and which will be easily controlled in flight as well as effecting good flying characteristics.

Other objects and features of the invention will be apparent in the subsequent description.

In general, our improved kite utilizes substantially the same principles as heretofore taught in our prior patent. This principle envisages the provision of an airfoil surface of a flexible nature such that it can expand and contract in accordance with the strength of the oncoming or supporting air so as to take advantage of light air currents, while at the same time maintaining a suitable angle of attack with respect thereto as controlled and guided by a plurality of bridle strings secured at various points adjacent to leading and trailing edges.

A detailed description of our invention will now be given in conjunction with the appended drawing in which:

Fig. 1 shows a plan view of the top side of the kite flattened out to reveal structural details.

Fig. 1a is an enlarged detail of a string attachment element.

Fig. 2 is a view showing the kite as it would appear in flight and being a forward view thereof.

Fig. 3 is a side view of the kite in flight.

With reference to Figs. 1 through 3, our improved kite comprises a generally quadrilaterally shaped airfoil 10 of suitably flexible and light material as heretofore specified and having a nose 12 flanked by swept back leading edges 14 and 16. The trailing edges of the kite are generally designated as 18 and 20, shown in brackets, which terminate in a tail area 22.

The trailing edges are concavely recessed at 24 and 26 so as to reduce the lift at the tail area which improves stability and makes use of a lighter tail possible. Further

the recessing effects a birdlike shape to the rear of the kite and the general configuration in flight is somewhat similar to what is now known as the flying-wing type of aircraft.

The area adjacent the nose may be folded along the lines 30 to increase stability and rigidity.

Various apertures are provided at the leading edges such as the apertures 32 and 34 for securing bridle strings as indicated in dotted lines, such as 36 and 38.

Reference to Fig. 1a the mode of attachment of the bridle strings will be understood; each bridle string being provided with a small and light metal ferrule such as 42 clinched at its mid point to the upper end of the string, which ferrules are threaded through respective apertures and serve to prevent the string from pulling out therefrom as will be understood from consideration of Fig. 1.

Additional bridle strings 46 and 48 are provided for the trailing edges and these strings may be adjustably secured at a series of apertures which are spaced and designated as L, M, and S, indicative of light, medium, and strong winds.

The bridle strings descend below the kite to a common juncture 52 and the main control string 54 descends from the juncture 52 down to the operator.

It will be noted that in addition to the three apertures L, M, and S, a fourth aperture 64 is provided for each series. The string is first threaded through aperture 64, thence through L for a light wind; for a medium wind the string is further threaded through M; and finally for a strong wind the string is further threaded through S.

The same scheme is used for securing the tail 67 to a line 68, wherein a pair of apertures 70 are provided in the kite body as shown.

With reference to Fig. 2, the arch of the airfoil is depicted, the cross-section of the arch being understood to be generally transverse of the oncoming air although at an angle thereto as determined by the angle of attack 74 as seen on Fig. 3.

Thus our kite is operative by virtue of a positive lift achieved, and is a true airfoil, the angle of attack being adjustable by selecting the number of apertures L, M, S through which the bridles are threaded.

It will be noted that a single, continuous conically shaped arch transversely of the longitudinal axis 76 is achieved, the apex being substantially at the nose 12, and that by virtue of the flexibility and resiliency of the kite material the lobes of the kite on either side of the longitudinal axis can expand or contract in accordance with the strength of the oncoming air. Thus a light breeze will permit the natural resiliency of the material to present a larger airfoil support area than a strong wind. This effect is more pronounced than that found in the construction of our prior patent and, of course, far surpasses any equivalent effect experienced in conventional kites. Further, a surprising degree of stability is achieved by the structure.

Various substitutions of material may be made, e. g., plastic ferrules, plastic strings, plastic kite body of polyethylene, and so forth, commensurate with light weight and foldability for compact storage.

It will be appreciated that the basic novelty and construction of our kite is not limited to uses as a toy, but could, in fact, be expanded to more serious purposes such as radar targets, parachutes, underwater tow devices, aircraft tow targets, and so forth.

Having thus described our invention we are aware that many changes are possible without departing from the spirit thereof, for example, various shapes may be used in addition to the generally quadrilateral shape illustrated, and other features may be modified as will be apparent to persons skilled in the art. Accordingly we do not

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seek to be limited to the precise embodiment shown herein except as set forth in the appended claims.

We claim:

1. A kite comprising an airfoil member of a flexible material having sweptback leading edges meeting at a forward point and trailing edges joining corresponding leading edges at lateral wing points, said trailing edges meeting at a tail area and being recessed to reduce the rearward tail surface, the arrangement thus presenting the appearance of a flying wing; means for attaching bridle strings to edges of said airfoil member, said bridle strings being joined at a point and exerting simultaneous tension on respective edges to form a single arch across said airfoil member in an airstream, said airfoil being held longitudinally tilted in flight by said bridle lines to effect an angle of attack, wherein the shape of said arch varies as the strength of the supporting wind and said angle of attack.

2. A kite comprising an airfoil member of flexible material capable of being arched by a supporting airstream and being shaped so as to effect a conical arch of the surface thereof transversely across the airfoil member, the crest of said arch being the longitudinal axis of said airfoil member, and bridle strings attached to said airfoil member on opposite sides of the longitudinal axis serving to guide and control said kite and present the surface thereof at a suitable angle of attack, wherein said airfoil member

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is comprised of paper-like material, having leading edges in a swept-back arrangement meeting at a forward point, said point being provided with folds radiating therefrom for stiffening of the area adjacent said point.

3. A kite comprising an airfoil member of flexible material capable of being arched by a supporting airstream and being shaped so as to effect a conical arch of the surface thereof transversely across the airfoil member, the crest of said arch being the longitudinal axis of said airfoil member, and bridle strings attached to said airfoil member on opposite sides of the longitudinal axis serving to guide and control said kite and present the surface thereof at a suitable angle of attack, including means for securing said bridle strings to said airfoil member at selective points thereof to vary the angle of attack depending on the strength of wind encountered.

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