Aug. 13, 1963 A. RESNICK 3,100,895

FOLDING KITE

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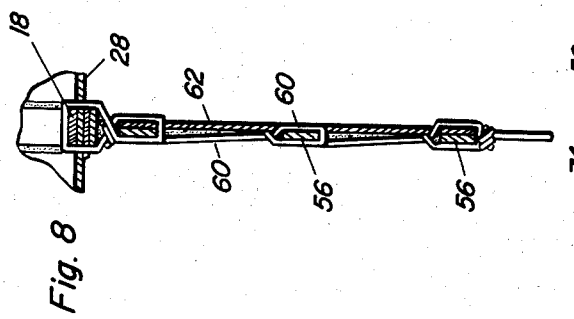


Fig. 8

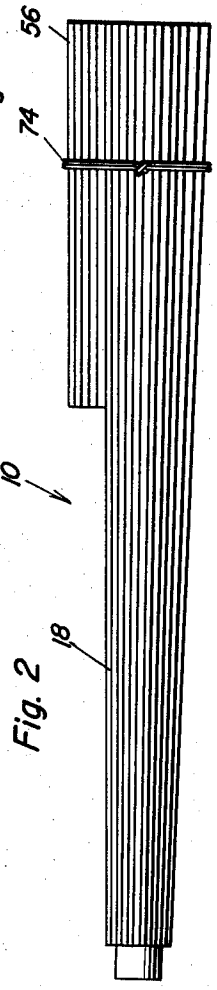


Fig. 2

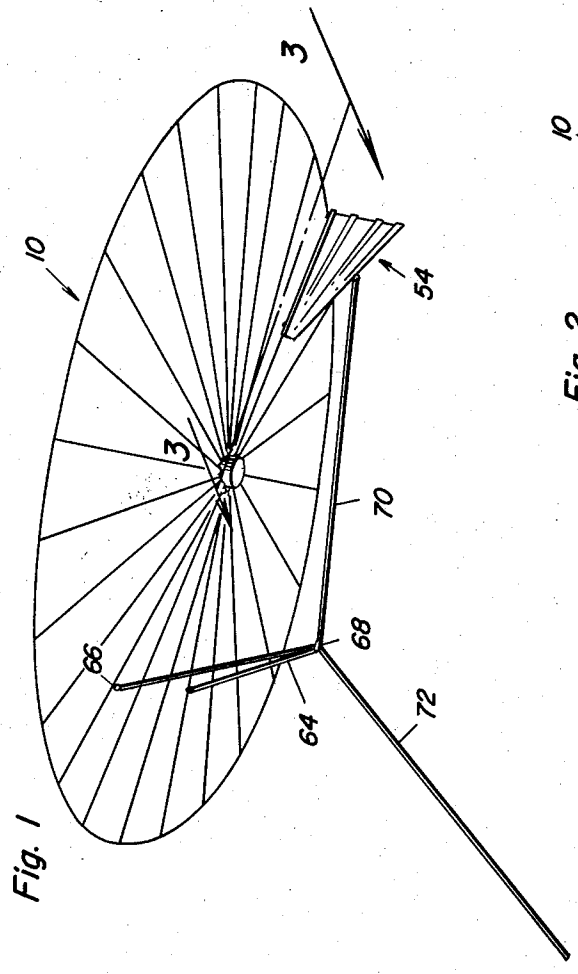


Fig. 1

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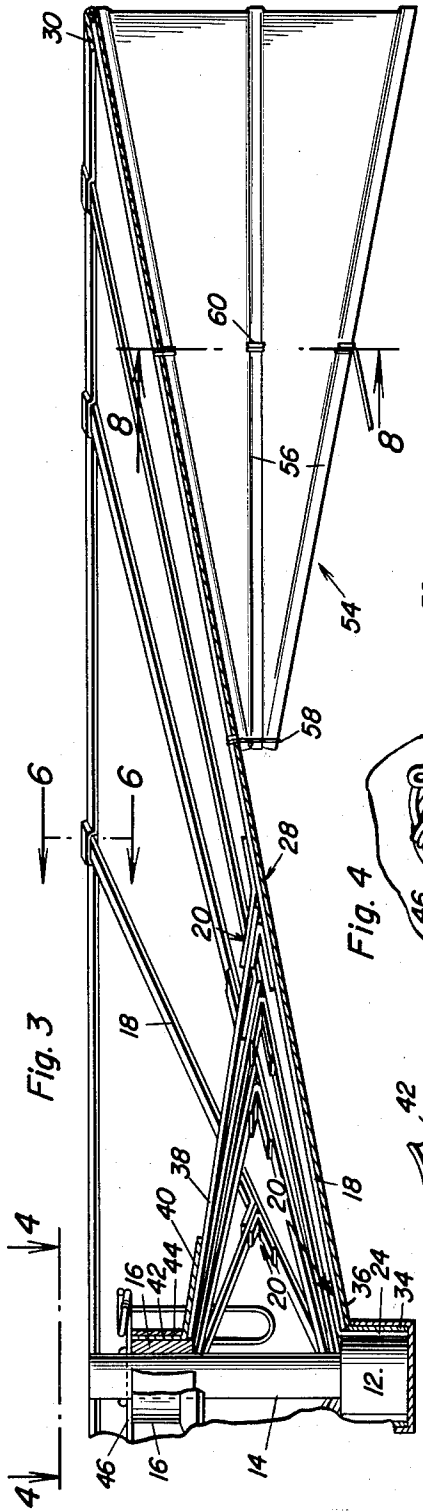


Fig. 3

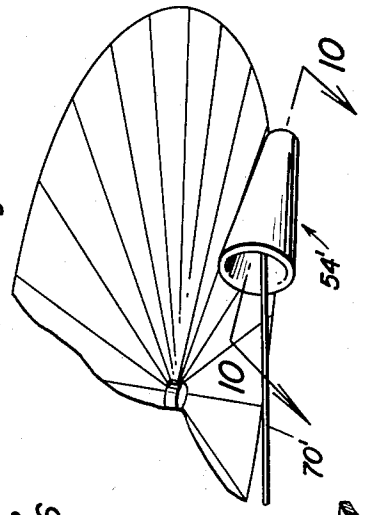


Fig. 7

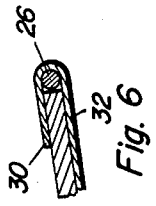


Fig. 6

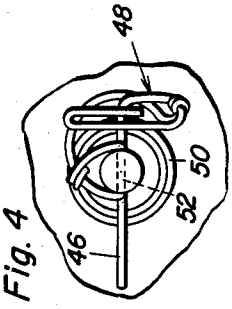


Fig. 4

Fig. 5

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FOLDING KITE

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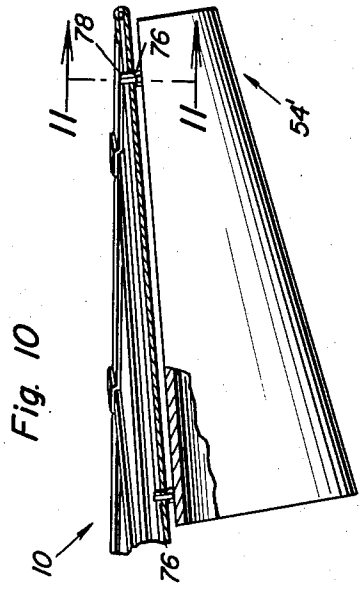


Fig. 10

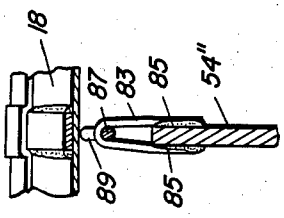


Fig. 13

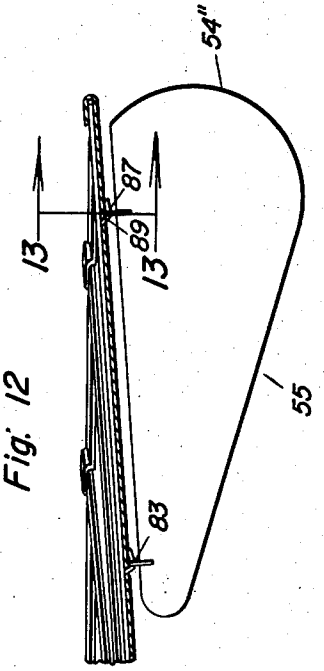


Fig. 12

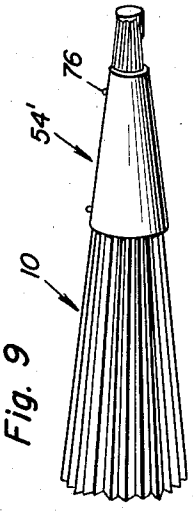


Fig. 9

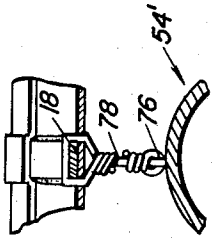


Fig. 11

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United States Patent Office 3,100,895 Patented Aug. 13, 1963

3,100,895

FOLDING KITE

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Filed July 14, 1961, Ser. No. 124,152
7 Claims. (Cl. 244—153)

This invention relates to kites and more particularly to kites of the folding type.

Accordingly, it is the primary object of this invention to provide a kite which may be easily folded up into a compact package for facilitating storage and transportation thereof.

It is another object of the invention to provide a kite that will fly in very minute winds, and yet will perform satisfactorily in an extremely strong wind.

It is another object of the invention to provide a kite that is extremely light in weight, is strong, and very durable in use.

It is yet another object of the invention to provide a kite having a novel tail, and in one form the tail may be used for holding the kite in a folded condition.

It is another object of the invention to provide a kite which does not require the usual long tail.

It is still another object of the invention to provide a kite which appears as a disc or a flying saucer when in operation.

It is still another object of the invention to provide a kite of such design and having aerodynamic characteristics which cause the kite to fly almost vertically above the operator thereof.

It is still another object of the invention to provide a kite which may be opened or folded instantaneously, and which is useful not only for purposes of entertainment, but also may be used for supporting radio and radar aerials and other electronic or wave devices.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part thereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view showing the kite unfolded and flying;

FIGURE 2 is an enlarged view showing the kite folded;

FIGURE 3 is an enlarged vertical cross sectional view taken substantially on the plane of line 3—3 in FIGURE 1;

FIGURE 4 is an enlarged plan view of the central portion of the kite;

FIGURE 5 is an exploded view in perspective showing the manner of assembling the framework of the kite;

FIGURE 6 is an enlarged cross sectional view taken substantially on the plane of line 6—6 of FIGURE 3;

FIGURE 7 is a view similar to FIGURE 1 showing a portion of a kite with a modified tail thereon;

FIGURE 8 is an enlarged vertical cross sectional view taken substantially on the plane of line 8—8 of FIGURE 3;

FIGURE 9 is a perspective view illustrating the kite and tail shown in FIGURE 7 in the folded position;

FIGURE 10 is an enlarged elevational view partially in section and looking in the direction of the arrows 10—10 in FIGURE 7;

FIGURE 11 is an enlarged cross sectional view taken substantially on the plane of line 11—11 of FIGURE 10;

FIGURE 12 is an elevational view of another modified tail assembly; and

FIGURE 13 is an enlarged vertical view taken substantially on the plane of line 13—13 in FIGURE 12.

As shown in the drawings, and particularly in FIGURES 1, 3 and 5, the kite 10 comprises an annular hub 12 which telescopically receives the lower end of a post 14 and is rigidly secured thereto by conventional means such as cement. The post 14 extends through an annular sleeve 16 which is axially slidable on the post. The hub 12 comprises the center of the kite which is of conical shape when unfolded and further comprises a plurality of radially and upwardly extending main ribs 18 which are equally spaced from one another as shown in FIGURE 3 and the inner ends thereof are secured to the upper peripheral edge of the hub 12. The main ribs 18 are pivotally connected to the periphery of the hub 12 by means of paper hinges 20 which are of rectangular shape and comprise two arms 22 and 24. The arms 22 overlap the inner ends of the main ribs and are cemented thereto. The arms 24 overlap the peripheral side surface of the hub 12 and are cemented thereto.

The outer peripheral ends of the main ribs 18 are circumscribed by a circular piece of string or twine 26 and cemented thereto. The undersurfaces of the ribs 18 are covered by a single piece of paper, plastic or other light material or substance 28 which is of conical shape, extends between the ribs and is cemented thereto. The outer end or peripheral edge 30 of the covering paper 28 is folded upwardly over the string 26 and outer end of the ribs 18 and back upon itself. The folded portion 30 as shown in FIGURES 3 and 6 is cemented to the outer ends of the ribs and to the outer peripheral edge portion 32 of the covering 28.

The inner or central portion of the covering 28 is folded downwardly and cemented to the outer periphery of the hub 12 as shown at 34. Thus it is apparent that the inner peripheral portion 36 and inner edge portion 34 of the covering also functions as a hinge in a similar manner as the hinge 20 for the main ribs 18. The paper 28 is preferably of light and tough variety such as bamboo paper.

The central portion of each main rib 18 is pivotally connected to the operating sleeve 16 by means of an operating rib 38. The outer end of each operating rib is pivotally connected to the central portion of a main rib by means of two paper hinges 20 which are secured by cement 38' to the ribs in the same manner as which the above described hinge 20 is secured.

The inner end of each operating rib 38 is secured to the lower peripheral edge of the sleeve 16 by means of a flexible conical member 40 having a cylindrical hub 42. The conical member and its hub 42 are preferably formed of paper and are cemented to the inner ends of the operating ribs 38 and the outer peripheral surface of the sleeve 16 respectively. The hub 42 is preferably enclosed in a sleeve 44 which is cemented thereto.

The upper end of the post 14 has a diametrical bore therethrough which slidably receives a stop pin 46. The pin 46 is preferably made of wire and has a head 48 bent into the form of a double loop. The head 48 is tied to one end of a securing string 50 whose other end also extends through the bore 52 in the upper end of the post 42 and is tied thereto.

The parts 12, 14, 16, 18 and 38 are all rigid and are preferably formed of some light wood such as Balsa or spruce or other light materials including plastics or compositions thereof.

The tail assembly 54 as shown in FIGURE 3 comprises a plurality of tail ribs 56 diverging in a rearward connection and connected together at their forward ends by a cord member 58. The ribs 56 are connected together at their central and rear portions also by cord members which are tied individually to each rib and extends therebetween as shown in FIGURE 8 at 60. The upper ends of these cord members extend through the

kite covering 28 and are tied to the main ribs 18. The tail assembly 54 is also covered by a paper covering 62 composed of the same material as the covering 28.

A V-shaped bridle string 64 is connected to the central portions by knots 66 of two forwardly extending main ribs. The two ribs to which the bridle string 64 is connected are spaced three ribs apart. The apex of the V-shaped bridle string 64 is connected by a knot 68 to a pilot string 70 and a main string 72. Preferably, the knot 68 slides along the string 72 and 70 which are preferably one integral piece.

FIGURE 1 shows the kite 10 unfolded and in flying position. The relative angle between the surface of the kite and the main string 72 may be adjusted by sliding the knot 68 along string 72. The tension in the pilot string 70 maintains the tail assembly 54 in an expanded position. The tail assembly 54 acts as a rudder and stabilizes the kite.

FIGURE 2 illustrates one way the kite may be folded. To fold the kite, it is only necessary to withdraw the pin 46 from the aperture 52 of post 14 and axially separate sleeve 16 from hub 12 whereby the inner ends of the operating ribs 38 are pulled upwardly, and their outer ends then pull main ribs 18 inwardly to the position shown in FIGURE 2. The entire kite assembly folds in a manner similar to the folding of a conventional umbrella. The ribs 56 of the tail assembly also fold together as shown in FIGURE 2, however, it is preferable to fold these ribs down over the outer surface of the folded ribs 18 rather than having them stacked as shown in FIGURE 2. The entire kite assembly may then be held together by a string 74.

In the form shown in FIGURES 7, 10 and 11, the tail assembly 54' is shaped as a hollow truncated cone and is preferably composed of some rigid light material such as Balsa wood or spruce. The pilot string 70' may be connected to the rear central edge of the kite and extend through the hollow interior of the tail assembly 54'. The tail assembly 54' is preferably connected to the kite 10 by means of two spaced wire U-clips 76 whose free ends extend into and are secured to the upper surface of the tail assembly. The U-clips 76 are supported by pieces of string 78 which are passed through the U-clips, over the rear portion of one of the rearwardly extending main ribs 18, and have their free ends tied together to form loops. The tail assembly 54' may be disconnected from the kite by untying and withdrawing string 78 from the U-clips 76.

FIGURE 9 illustrates how the tail assembly 54' may be telescoped over the folded kite 10 to maintain it in its folded condition.

FIGURES 12 and 13 illustrate an alternative tail assembly 54'' which merely comprises a rigid plate of triangular shape and having its rearward and forward ends rounded. The tail assembly 54'' has its upper edge straddled by two U-clips 83 whose legs are cemented thereto at 85 as shown in FIGURE 13. The rear portion of a rearwardly extending rib 18 has two spaced L-shaped spring clips fixed thereto. Each spring clip comprises a vertical leg 89 extending into and cemented to the rib 18 and a horizontal rearwardly extending leg 87 inclined to the rib and which may be deflected to extend into one of the U-clips 83. Thus the U-clips and L-shaped clips comprise a means for releasably hinging tail assembly 54'' to the kite.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A kite comprising a plurality of radially diverging ribs, a center post, means pivotally connecting the inner ends of the ribs to said post adjacent one end thereof, means limiting movement of said ribs between a first position extending substantially parallel to said post and a second position substantially perpendicular to said post, means releasably maintaining said ribs in said second position, a one-piece flexible covering secured to and extending between said ribs, and a tail secured to the kite and extending radially inwardly from the periphery of the kite to a point spaced outwardly from the center post, said tail being orientated entirely beneath the plane of said kite and substantially perpendicular thereto when said ribs are in said second position.

2. A device as defined in claim 1 wherein said tail comprises foldable ribs connected together by a flexible covering.

3. A device as defined in claim 2 wherein said foldable ribs have the inner ends thereof pivotally secured together, said foldable ribs diverging outwardly from said inner ends.

4. A device as defined in claim 3 including means for maintaining the tail in an expanded condition during the flying of the kite.

5. A device as defined in claim 4 including a flexible cord tied to the central portion of each foldable rib, said cord limiting the unfolding of the tail, the upper end of the cord securing the tail to a kite rib.

6. A device as defined in claim 1 wherein said tail comprises a triangular flat rigid plate, releasable hinge means connecting said plate to one of said ribs.

7. A device as defined in claim 1 wherein said tail comprises a hollow truncated cone connected to the kite by releasable means, said cone adapted to telescopically receive said kite when folded.

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