United States Patent [19]

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[54] **MULTI-KEELED KITE**

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[52] **U.S. Cl.** ..... **244/153 R**

[51] **Int. Cl.** **B64c 31/06**

[58] **Field of Search** ..... 244/153 R, 154, 155 R, 244/DIG. 1, 142, 145, 146

[56] **References Cited**

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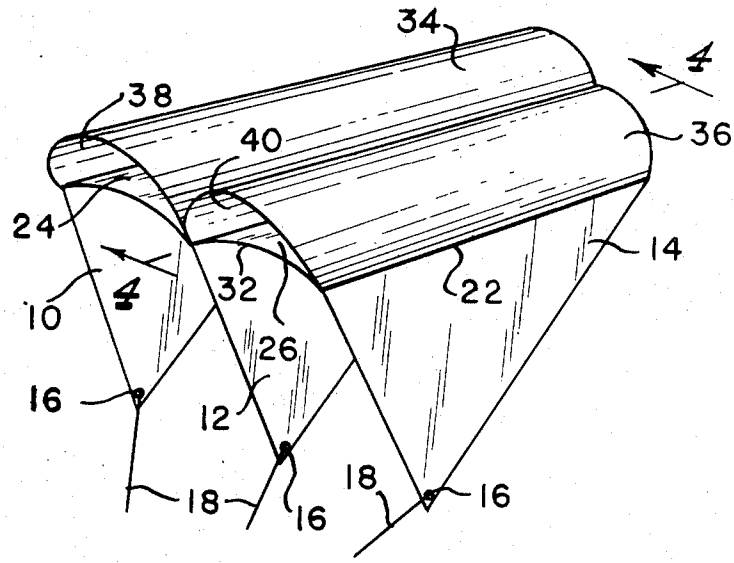
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[57] **ABSTRACT**

A multi-keeled kite including a horizontal panel between the keels and a panel overlying the horizontal panels and forming therewith an open ended passage of uniform cross section extending from the leading to the trailing end of the kite. The passages are inflated by air movement and aid in maintaining the kite in flying configuration and in increasing lift of the kite.

8 Claims, 5 Drawing Figures



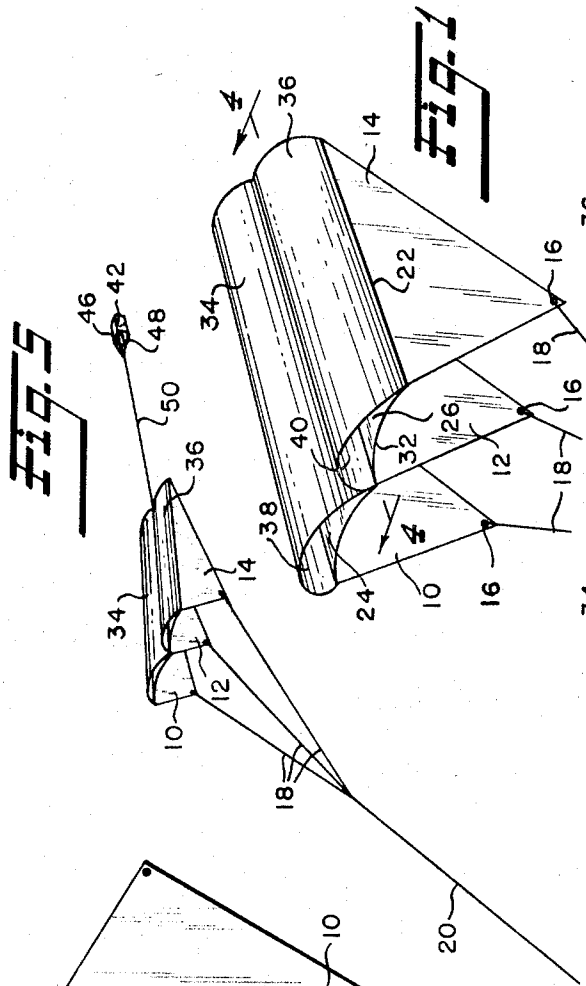


Fig. 1

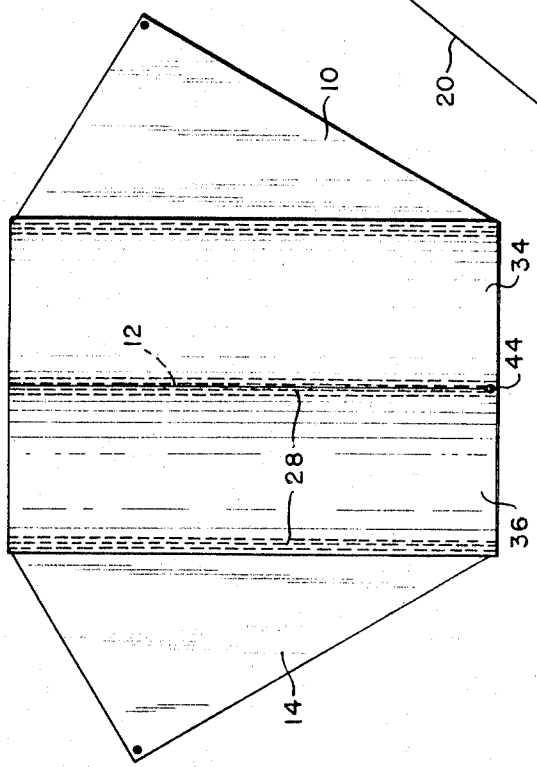


Fig. 2

Fig. 5

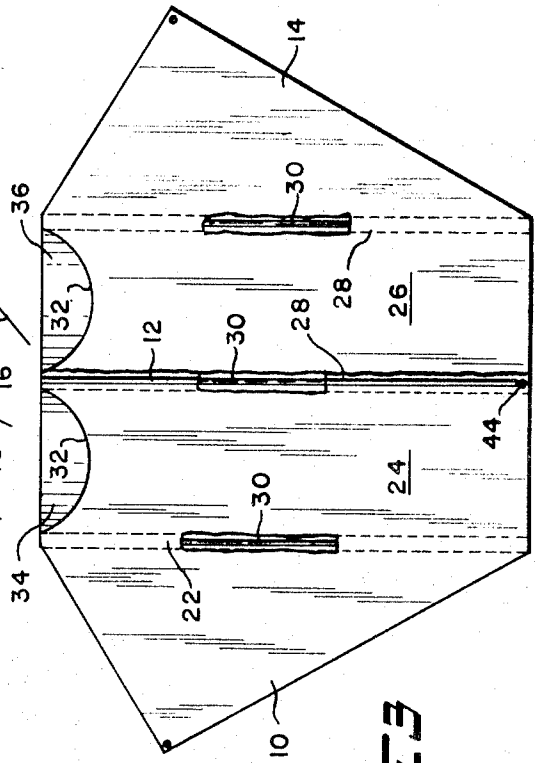


Fig. 3

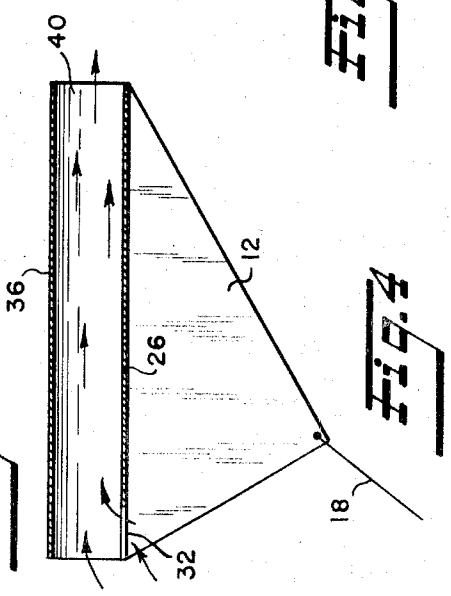


Fig. 4

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MULTI-KEELED KITE

This invention relates to kites, and more particularly to kites with multi-keels and air chambers.

Multi-keeled kites composed of vertical flaps of sheet material connected at their lower end to a kite string and interconnected at their top edges by flexible, substantially horizontal panels are known. However, such kites are difficult to fly because usually two hands are required to hold the kite open to the wind while another person is required to control the string. Furthermore, such kites have a tendency to increasingly bag as the wind increases so as to lose their most efficient flying configuration whereby the kites at greater than ordinary breezes tend to collapse or power loop.

Multi-keeled parachutes have been provided with tapered air passages which overlie and are formed in part by the horizontal panels but so far as is known these air passages have invariably been tapered so that air entering the wide mouths of the passages is compressed in a ram jet action to exit out of a reduced exhaust opening at the opposite end, whereby the parachute is induced to descend along a slanting path rather than a vertical path. Ram jet passages for multi-keeled kites serve little purpose so far as a kite's flying ability is concerned and they also have not been satisfactory for kites because of the difficulty in holding the passages open long enough to fill with wind. Furthermore, the tapered passages are difficult and expensive to manufacture.

The broad object of the present invention is to provide an improved multi-keeled kite which is capable of automatically spreading itself to the breeze and maintaining its shape while flying regardless of change in wind velocity.

Another object of the invention is to provide a kite which accomplishes the foregoing while also having the ability to become air borne even in a light breeze with a minimum of effort and in a minimum of space.

I have discovered that a multi-keeled kite made of extremely limp or collapsible material such as thin nylon cloth, plastic sheeting, paper or the like will automatically spread to the wind without any manual effort if the horizontal panels between the keels are provided with overlying layers of similar sheeting material which inflate by air movement and form with the panels, passages of uniform cross section parallel to the keels of the kite. It will be found that when a kite constructed in accordance with the invention is exposed limply to a breeze these passages instantly inflate so that the kite is brought immediately into flying configuration and rapidly becomes air borne at a steep angle approaching the vertical with no need for the user to run or have any more than a slight scope on a kite string in order to get the kite airborne. Once airborne, the kite flies with marked stability which can be enhanced, in greater than ordinary breezes, by the use of a stabilizing drogue.

The invention will now be described with greater particularity and with reference to the accompanying drawings wherein:

FIG. 1 is a perspective view of the kite of the invention showing it in its air borne configuration;

FIG. 2 is a top plan view of the kite showing its side keels spread outwardly;

FIG. 3 is a plan view similar to FIG. 2 but showing the opposite side of the kite;

FIG. 4 is a vertical cross-sectional view taken substantially on the line 4—4 of FIG. 1; and

FIG. 5 is a perspective view of the kite on a reduced scale showing it flying with the use of a drogue.

Referring now to the drawings, the numerals **10, 12, 14** refer to keels of the kite, each of which may be of limp cloth material or plastic sheeting preferably defining triangles whose lowermost points may be right angular and contain grommets **16** for harness lines **18**, which are attached to a kite line **20** at a common point as shown in FIG. **5.** The points of attachment on the keels for the harness lines should be closer to the leading ends of the keels than to their trailing ends.

The elongated upper edges **22** of adjacent keels are interconnected by horizontal panels **24, 26** which may be of the same limp material as the keels. The keels and horizontal panels may be sewed or otherwise connected together in such a fashion that elongated pockets **28** are formed at their contiguous edges to encase elongated stiffening elements **30** such as wooden dowels or the like. As can be seen, the front or leading edge of each horizontal panel **24, 26** is recessed rearwardly by arcuate cutouts as shown at **32** in FIGS. **1, 3** and **4,** particularly. The purpose of these recesses will become apparent hereinafter.

Overlying the horizontal panels **24, 26** are panels **34, 36** of greater transverse dimension than the horizontal panels **24, 26** by an amount such that when the panels **34, 36** are inflated by a breeze, they form with the horizontal panel **24, 26** uniform passages **38, 40** which are preferably substantially semi-cylindrical from front to rear, as can be clearly seen in FIG. **4.** The laterally spaced apart lines of attachment of each overlying panel **34, 36** with each of the respective horizontal panels **24, 26** are parallel with the keels and preferably coincide with the lines of attachment of the keels with the horizontal panels.

In use, the kite with a string **20** attached to the harness lines **18,** which in turn are connected to the grommets **16** of the respective keels **10, 12, 14,** need merely be exposed to a breeze for the air to act against the inner surfaces of the upper panels **34, 36** whereby these are immediately inflated. The breeze is guided against the inner surfaces through the cutouts or recesses **32** at the leading edges of the horizontal panels as more clearly shown by the arrows in FIG. **4.** As the panels **34, 36** inflate they simultaneously laterally stretch the horizontal panels **24, 26** so that the kite is spread into its flying configuration and becomes immediately air borne at an unusually steep angle approaching the vertical. The breeze maintains the overlying panels **36** in their inflated condition so that the kite retains its shape regardless of the strength of the wind without any tendency of the horizontal panels to bag increasingly in response to the force of the wind as would be the case were the kite not to be provided with panels.

When the force of the breeze ranges between about **15** and **25** miles per hour any tendency of the kite to loop can be eliminated by streaming a drogue **42** (see FIG. **5**) from a suitable grommet **44** located centrally in the trailing edge of the kite as shown in FIGS. **2** and **3.** The drogue may comprise a truncated conical sleeve whose wide end **46** is connected by a harness **40** to a string **50** leading to the grommet **44.**

Because the kite of the invention inflates and rises immediately with a short initial scope on the string, it can be readily flown in restricted areas, as between

buildings, or from boats of any size since no space is required for the user to run in order to get the kite airborne, as is often the case with other kites. Thus the kite can serve not only as a source of amusement but when flown from boats and the like can also be used as a signal.

The number of keels and corresponding horizontal and overlying panels can be increased indefinitely or the kite can be limited merely to a pair of keels with single horizontal and overlying panels. Not only do the overlying panels aid in maintaining the kite in flying configuration but they also increase aerodynamic lift.

What is claimed is:

1. A kite comprising a plurality of transversely spaced apart, vertical keels having elongated upper edges, means for attaching a harness line to a point adjacent the lower edge of each keel, said point being closer to the front end of a keel than to its trailing end, a substantially horizontal panel extending between the elongated upper edges of adjacent keels, and an upper panel overlying said horizontal panel and being longitudinally attached to said horizontal panel along transversely spaced apart parallel lines extending longitudinally of said horizontal panel in parallel relationship with respect to said keels, the material of said upper panel having throughout its length a uniform transverse width between said lines of attachment which is greater than the transverse spacing of said lines on said horizontal panel so that said upper panel forms with said horizontal panel a passage on the upper side of said kite which is open at both ends and uniform in size throughout its length.

2. The kite of claim **1** wherein the leading transverse edge of said upper panel projects forwardly beyond the leading transverse edge of said horizontal panel.

3. The kite of claim **1** including elongated stiffening elements at the junctures of each of said keels and a horizontal panel attached thereto.

4. The kite of claim **1** wherein said kite is constructed of collapsible sheeting material.

5. The kite of claim **1** including a steadying drogue connected to the trailing end of the kite.

6. The kite of claim **5** wherein said drogue is in the form of a truncated conical sleeve, and string means connecting the wide end of said sleeve to said kite.

7. The kite of claim **1** wherein the leading edge of a horizontal panel between two keels is recessed rearwardly of the leading edge of the overlying panel.

8. The kite of claim **1** wherein the edges of the overlying panels are co-extensive with the laterally spaced edges of the horizontal panels.

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