April 16, 1957 M. KOLLER 2,788,792

WIND-RESISTANT REVERSIBLE UMBRELLA

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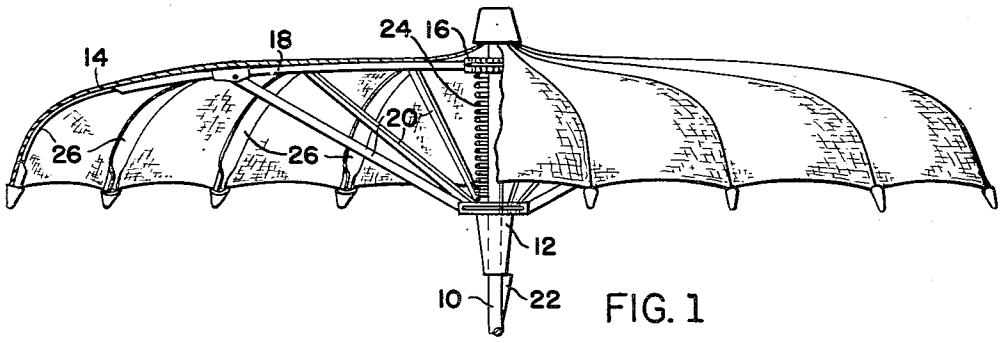

FIG. 1

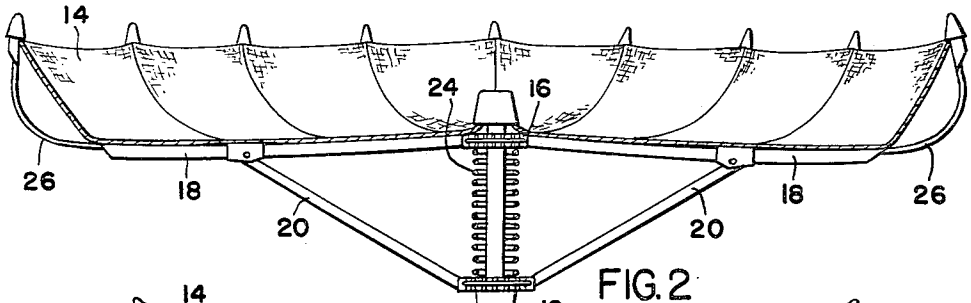

FIG. 2

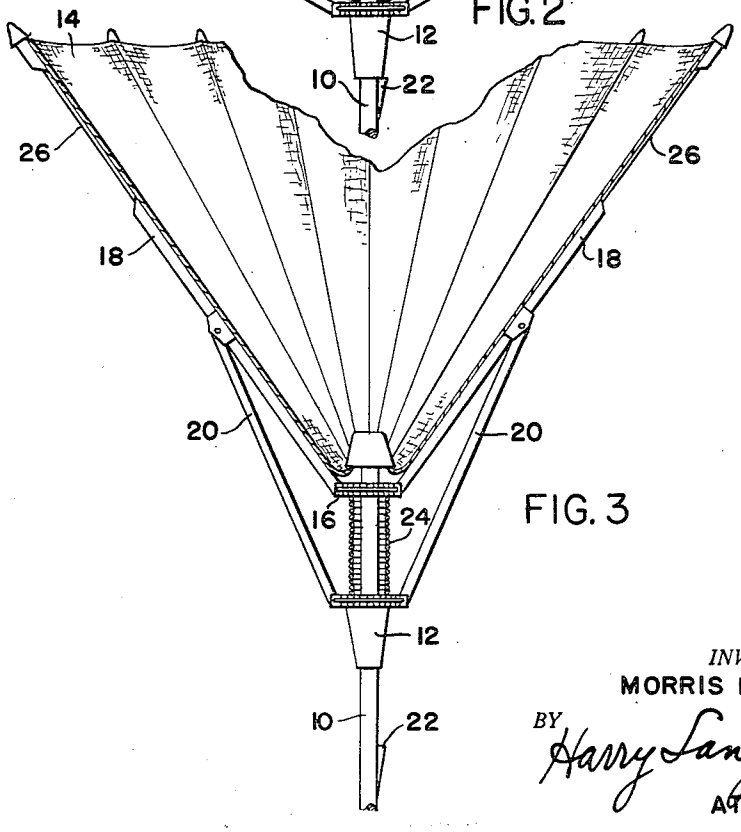

FIG. 3

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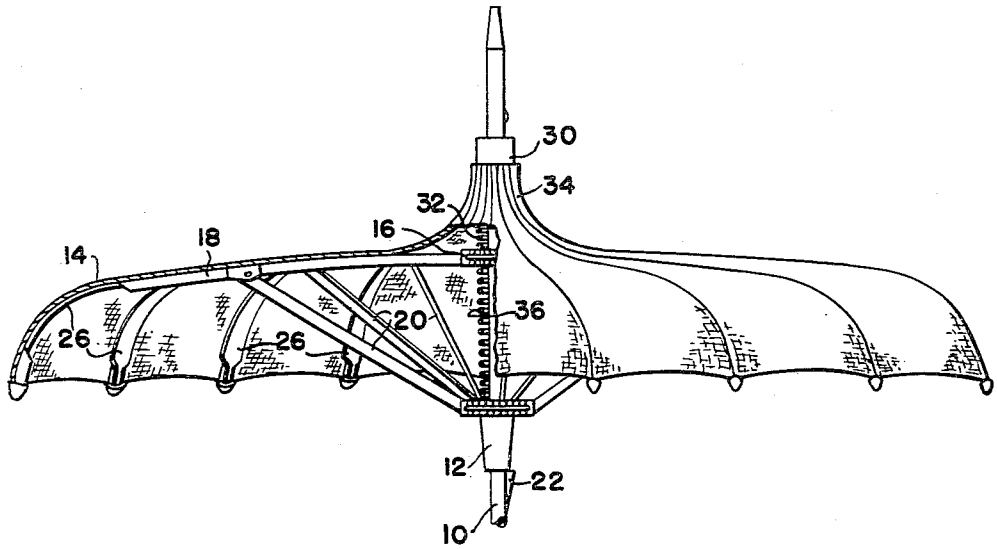
FIG. 4



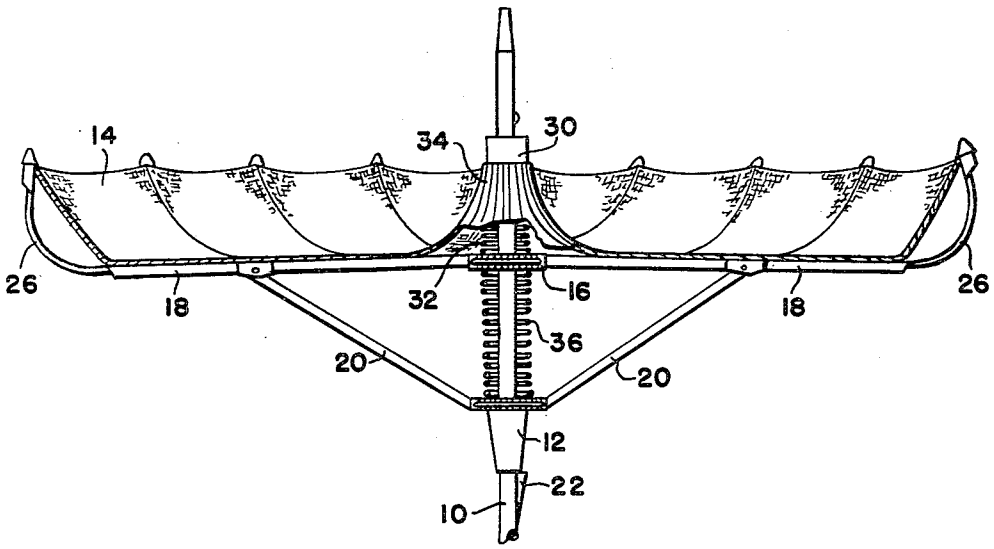


FIG. 5

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WIND-RESISTANT REVERSIBLE UMBRELLA

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FIG. 6

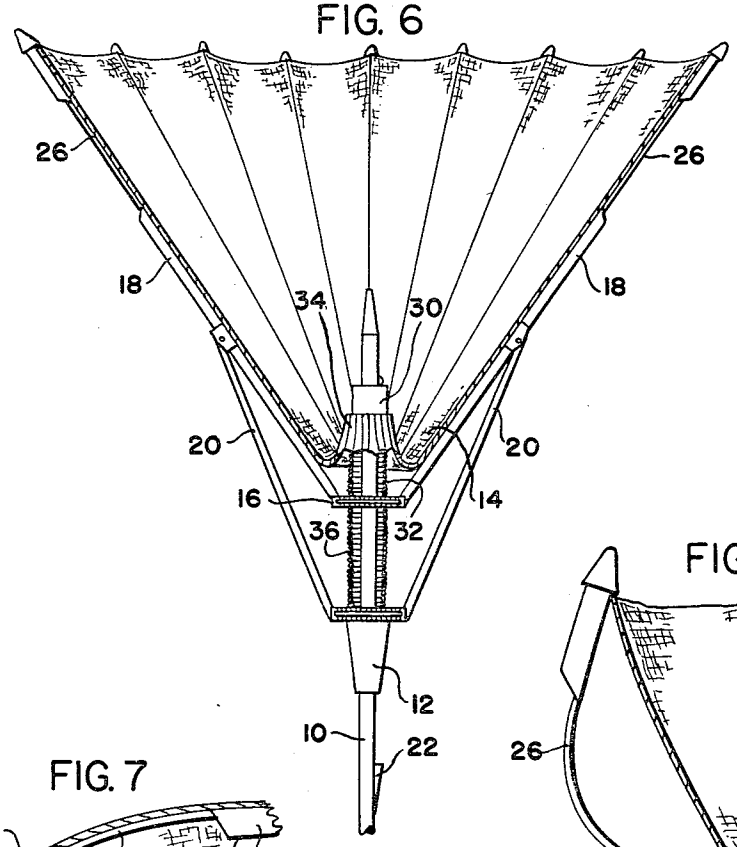


FIG. 8

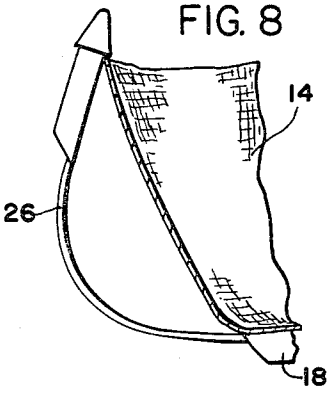
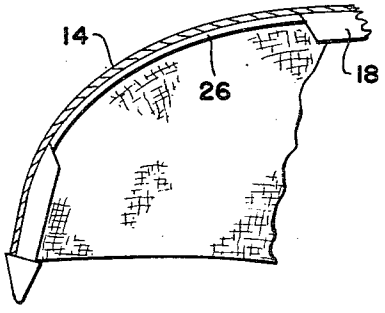


FIG. 7



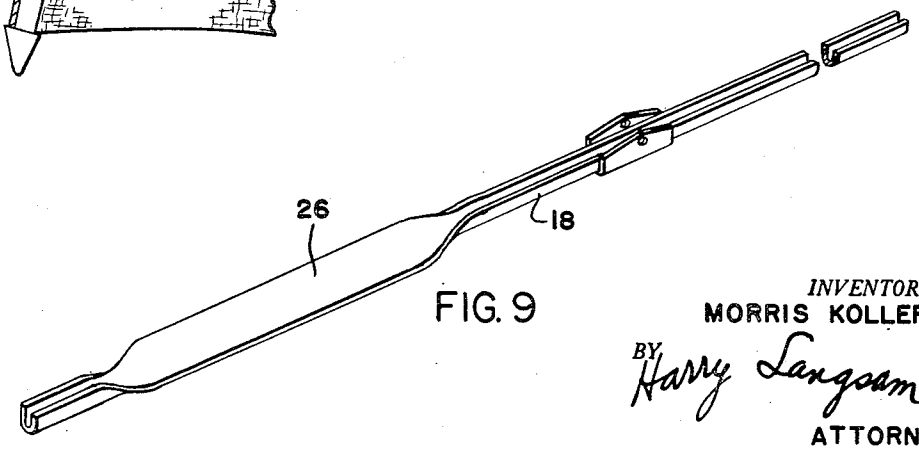


FIG. 9

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2,788,792

WIND-RESISTANT REVERSIBLE UMBRELLA

Morris Koller, Philadelphia, Pa.

Application March 2, 1955, Serial No. 491,580

3 Claims. (Cl. 135—20)

My invention relates to an umbrella, and more particlularly, relates to a wind-resistant umbrella which may be reversed in curvature without damage.

Heretofore, reversible umbrellas have employed complicated lever and spring systems to enable the umbrella cover and ribs to reverse in direction without tearing or incurring other damage when gusts of wind would strike from below.

It, therefore, is an object of my invention to provide an umbrella which will reverse in curvature without damage to any of its parts when struck by wind, rain, or hail gusts from below.

Another object of my invention is to provide a reversible umbrella having a pleasing downwardly, concave contour when in normal raised position.

Another object of my invention is to provide a reversible umbrella which may easily be returned by the user to normal raised position should the umbrella be blown inside out by the elements.

Another object of my invention is to provide a reversible umbrella having a pagoda-like appearance which will continue to be weatherproof without sustaining damage when guests of wind strike the umbrella from below.

Other objects of my invention are to provide an improved device of the character described, which is easily and economically produced, that is sturdy in construction, and highly efficient in operation.

With this and related objects in view, my invention consists in the details of construction and combination of parts, as will be more fully understood from the following description when read in conjunction with the accompanying drawings, in which:

Fig. 1 is a sectional view showing an umbrella embodying my invention wherein the umbrella is shown in normal opened position and the cover is shaped over the ribs in a downwardly concave direction.

Fig. 2. is a sectional view showing the umbrella in a position wherein the ribs are flexed in an upwardly concave direction thereby enabling the cover to reverse in curvature without undue strain on the fabric.

Fig. 3 is a sectional view showing the umbrella after it has completed its reverse curvature.

Fig. 4 is a partial sectional view of a modification in my umbrella wherein the cover is mounted upon a slideable collar to provide a shape variation which is pagoda-like in appearance.

Fig. 5 is a sectional view of the pagoda umbrella showing the ribs flexed in an opposite direction about the resilient leaf.

Fig. 6 is a sectional view of the pagoda-like umbrella as it has been completely blown inside out.

Fig. 7 is an enlarged fragmentary sectional view showing the manner in which the cover is drawn taut over the resilient ribs.

Fig. 8 is an enlarged sectional view showing the resilient portion of the rib flexed upwardly concave as the umbrella has initiated its reverse in curvature.

Fig. 9 is a perspective view of the rib and showing the resilient leaf portion embodying my invention.

Referring now in greater detail to the drawings, in which similar reference characters refer to similar parts, I show a reversible umbrella having a central staff **10**, a runner **12** slideable thereon, and a fabric cover **14**. Permanently affixed to the upper portion of the staff **10** is a collar **16** to which is pivotally mounted a plurality of ribs **18**. The ribs **18** are substantially channel-shaped in cross-section and extend radially outward from the staff **10**. A like plurality of stretchers **20** are each pivotally connected at one end to the runner **12** and at the other end to a point intermediate the ends of a respective rib.

In my preferred embodiment, the stretchers **20** are connected at a point approximately one inch inwardly on the ribs **18** as compared to a conventional umbrella. A latching ear **22** mounted upon the staff **10** serves to engage the runner **12** to hold the rib structure in extended position. In order to maintain greater pressure of the runner **12** against the latching ear **22** and to provide additional reverse thrust as the umbrella is raised, a spring **24** is axially compressed upon the shaft **10**.

Each of the ribs **18** is provided with a flattened portion **26** adjacent its outer end to define a resilient leaf. When the umbrella is raised into its open position, the cover **14** is drawn taut over the ribs **18** and flexes the resilient portion **26** of the ribs so that the cover assumes a pleasing downwardly concave contour. This contour is termed in the trade as an India type umbrella.

In Figs. 4, 5, and 6, I show an umbrella shape modification which is commonly referred to by the trade as a pagoda-type. In this embodiment, the cover **14** is secured at its central portion to a sleeve **30** which is slideable upon the staff **10** above the fixed collar **16**. The staff **10** has a greater dimension above the fixed collar **16** than the India type umbrella heretofore described. A spring **32** is axially mounted upon the staff **10** intermediate its upper end and the collar **16**, the ribs **18**, the stretchers **20** and the runner **12** being substantially identical in construction and operation to the India type umbrella.

When the pagoda umbrella is raised, the spring **32** thrusts against the sleeve **30** and the center portion of the cover **28** is forced upward to form a canopy top **34**.

In both the India type and the pagoda type umbrellas herein described, the leaf **26** flexes and buckles during the reverse in contour of the cover. This results in a transitory shortening of the effective length of the ribs **18**. Therefore, undue tensile stress upon the fabric cover is substantially eliminated either when the cover is blown inside out or when manually returned to normal operating position.

Although my invention has been described in considerable detail, such description is intended as being illustrative rather than limiting, since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

I claim as my invention:

1. A reversible umbrella comprising a central staff, a cover, a runner slideable upon said staff, a plurality of ribs pivotally connected to a fixed collar upon said staff and radially extending outward therefrom, a like plurality of stretchers, each pivotally connected at one end to said runner and at the other end to a point intermediate the ends of a respective rib, each said rib having a flattened portion adjacent its outer end, said flattened portion forming a resilient leaf, a sleeve slideable upon said shaft adjacent its upper end, a spring axially compressed upon said shaft intermediate said sleeve and said fixed collar, said cover being affixed to said sleeve and being drawn over said ribs and flexing the resilient portion of said

ribs whereby said cover assumes a downwardly concave contour having a centrally located canopy when the umbrella is in a normally extended position.

2. The invention of claim 1 wherein the resilient leaf flexes and buckles during a reverse in contour of the cover to transitorily shorten the effective length of the ribs when said cover is blown inside out or when manually returned to normal operating position.

3. A reversible umbrella comprising a central staff, a sleeve and a runner, each slidable upon said staff, a fixed collar mounted upon said staff intermediate said sleeve and said runner, a plurality of ribs pivotally connected to said fixed collar and radially extending outward therefrom, a like plurality of stretchers, each of said stretchers having one end pivotally connected to said runner and the other end pivotally connected to a rib intermediate the rib's ends, each of said ribs having a flattened portion adjacent its outer end, said flattened portion forming a resilient leaf, a spring axially compressed upon said shaft intermediate said sleeve and said fixed collar, a latching ear on said shaft spaced below said fixed collar, a second spring axially mounted upon said shaft intermediate said fixed collar and said latching ear, said second spring being axially compressed by engagement with said runner to maintain said runner against said latching ear when the umbrella is in open position, and a cover affixed to said sleeve and to the end of each rib, said cover assuming a downwardly concave contour about each resilient leaf with a centrally located canopy when the umbrella is in an open position, said ribs being adapted to flex about the resilient leaf during a reverse in contour of said cover when said cover is blown inside out or when manually returned to closed position.

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