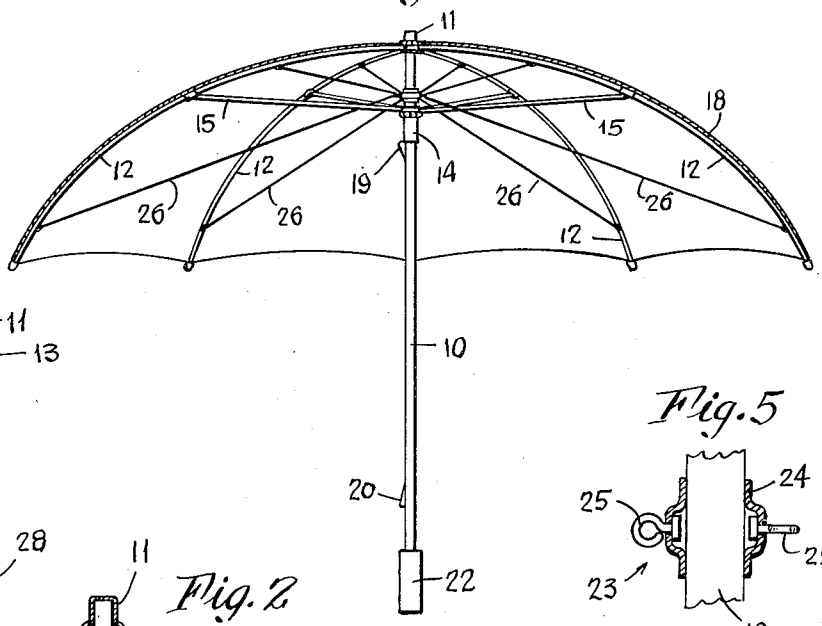
Sept. 19, 1950 S. M. SENNA 2,522,645

UMBRELLA

Filed April 19, 1949

Fig. 1



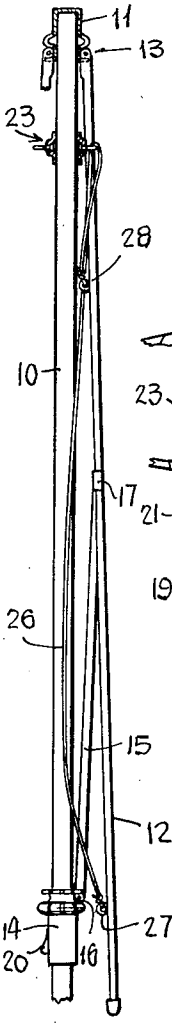


Fig. 3

Fig. 2

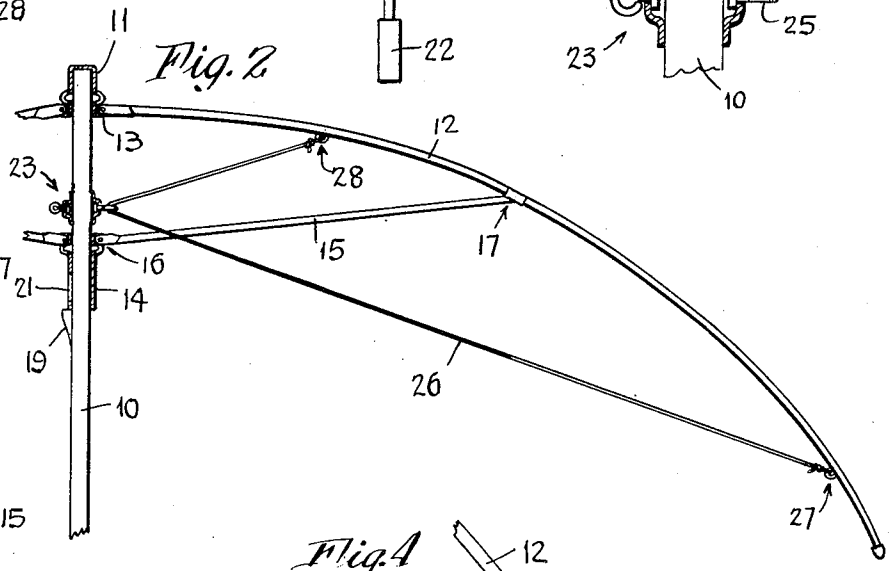
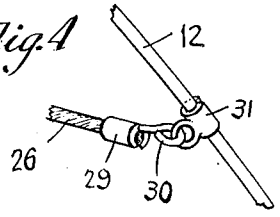


Fig. 5

Fig. 4



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UMBRELLA

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6 Claims. (Cl. 135—27)

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The present invention relates to foldable umbrellas and is particularly directed to means therein for preventing the umbrella from turning inside out.

Heretofore means have been provided on umbrellas to prevent the same from turning inside out, such as connectors extending from the stick of the umbrella to the tip of the rib to hold the rib against moving upward, for example, as when a strong wind gets under the umbrella. However, these have not been entirely satisfactory since the connector, together with the stretcher and rib extending therebetween, forms in effect a truss member which pivots about the connection of the stretcher to runner on the stick and tends to lift the inner end portion of the rib putting an undue stress thereon which may cause the rib to buckle between the pivoted end thereof and the stretcher connection.

The present invention overcomes this difficulty by providing a reinforcing member which holds the inner portion of the rib against upward movement as upward pressure is applied to the tip.

This is accomplished according to the present invention by providing in combination with the ribs and stretchers therefore, guide means on the stick and flexible reinforcing connectors slidable in the guide means and having their ends connected to the ribs adjacent the free ends thereof and to a point on the rib between its pivoted end and the stretcher connection thereto. The connectors are of such a length that they are taut when the umbrella is in open position and any pressure on the end of the rib in this position tending to move the rib upwardly, will cause a pull on the connector which will be transmitted to the inner portion of the rib between the pivoted mounting and the stretcher connection to hold it against upward movement.

Another feature of the invention resides in the location of the guide means to position the connector well within the umbrella in open position so that it will not interfere with the user and to hold the flexible connector in looped relation within the umbrella, when the umbrella is in closed position, so that it can not become tangled with the ends of the ribs and interfere with the opening of the umbrella.

Another feature of the invention resides in the fact that the reinforcing means is simple of construction and may be easily built into new umbrellas or applied to existing umbrellas without substantial alteration of the present structure of the umbrella.

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A still further feature of the invention resides in the fact that the reinforcing means so strengthens the ribs of the umbrella that fewer ribs may be employed in umbrellas without sacrificing any strength or rigidity of the umbrella.

Other features and advantages of the invention will be apparent from the specification and claims when considered in connection with the drawings in which:

Figure 1 shows a sectional view of the umbrella in extended position.

Fig. 2 shows an enlarged detailed view of a rib in extended position with the reinforcing member in position thereon.

Fig. 3 is a view similar to Fig. 2 with the rib in closed position.

Fig. 4 is a detailed view of another form of connector fastening.

Fig. 5 is a detail of the guide means.

As shown in the drawings, the umbrella comprises a stick 10 having secured thereto adjacent its upper end a sleeve or thimble 11. A plurality of ribs 12 each have one end pivoted at 13 to the thimble so that the ribs extend radially from the stick. In order to move the ribs about the pivots, a runner 14 is slidably mounted on the stick to operate a plurality of stretchers 15. Each stretcher has one end pivotally mounted at 16 to the runner and the other end pivotally connected to the rib at 17 in such a manner that when the runner is in its lower position, as shown in Fig. 3, the stretcher causes the rib to be contracted into closed position adjacent the stick, whereas when the runner is moved to its upper position, as shown in Fig. 1, it causes the stretcher to extend the rib into the open position of the umbrella.

The plurality of ribs have secured thereto to be supported therebetween as shown in Fig. 1 the usual covering 18 of textile or other flexible material.

The runner is held in its upper or open position by the usual spring latch 19 carried by the stick and engaging the bottom surface of the runner and is held in its closed position by the usual spring latch 20 which passes through the opening 21 in the runner and the stick may be formed or provided with a usual handle 22 if desired.

According to the present invention means are provided for reinforcing the ribs to hold them against turning inside out when a strong wind or the like applies pressure to the underside of the umbrella.

In the preferred form of the invention a guide

means 23 is mounted on the stick between the sleeve 11 and the upper position of the runner 14 as shown in Figs. 1 and 2. While the guide means may take many forms, it is herein illustrated as comprising a sleeve-like member 24 secured to the stick in any suitable manner and having guide eyes 25 mounted thereon. While the guides may be mounted in various ways it is at present preferred to mount them for rotary movement to enable them to assume a proper position during the guiding operation.

A reinforcing connector 26 is carried by the guide means and has one end connected to an eye 27 adjacent the free end of the rib and the other end connected to an eye 28 disposed on the inner portion of the rib extending between the pivot 13 and the connection to the spreader 15. Eye 28 is positioned along the mid-portion of this inner portion of the rib for the purpose as will be explained. The reinforcing connector in the present preferred form of the invention is a flexible member made of wire, nylon strand or braid or other strong flexible material which is resistant to stretching. The flexible connector is slidably carried by the guide eyes 25 and its ends are connected to eyes 27, 28, by tieing as shown in Figs. 1 and 2, or by a clip 29 having an eyelet 30 secured to the ends of the connector as shown in Fig. 4, which eyelet can be interlocked with the eyes 27 and 28 to secure the connector thereto.

The reinforcing connector is of such a length that when the umbrella is in open position as shown in Fig. 1 it will be taut and any force tending to lift the end of the rib will produce a pull on the connector which will be transmitted thereby to provide a downward force on the inner portion of the rib and reinforce and hold the same against moving upward under said uplifting force.

The guide eyes through which the connectors slide are preferably positioned to one side of the stretchers to hold the connectors out of rubbing engagement with the stretchers when in open position and provided with an antifriction surface, for example, a polished chrome plate surface or an agate or baked enamel surface so that the eyes do not wear the reinforcing connectors as they slide therethrough.

As will be noted from Figs. 1 and 2 the guide means is so arranged on the stick that the reinforcing connector is held well up within the open umbrella so that it will not interfere with the user, and as shown in Fig. 3 the guide means is disposed above the ends of the flexible connector and forms a loop in the flexible connector to maintain it within the umbrella when it is in closed position so that it does not become tangled with the ends of the ribs and interfere with the opening of the umbrella.

The reinforcing connector of the present invention does not substantially alter the conventional construction of the umbrella or its mode of operation and can be readily applied thereto with a minimum of effort.

The only modification of the ribs is in the provision of the eyes 27, 28 thereon which may be formed integrally with the ribs when the ribs are made by a simple piercing and forming operation or may be formed as a separate member 31 which is clamped securely to the rib as shown in Fig. 4 when it is desired to convert an existing umbrella into one embodying the present invention.

Furthermore, with the present invention, it is possible to decrease the cost of the manufacture of an umbrella by decreasing the number of ribs therein inasmuch as the reinforcing member strengthens the ribs and will provide adequate support for the cover of the umbrella with a fewer number of ribs.

While in the foregoing description the reinforcing member has been described as a flexible connector it is to be understood that any connection which will hold the tip against upward movement and will transmit the pull on the tip into a downward pull on the inner portion of the rib may be used.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. In an umbrella, a stick; a rib having one end pivotally mounted on the stick; a stretcher for the rib having one end pivotally connected to the underside of the rib intermediate the ends thereof, said stretcher moving the rib to extended position; guide means on the stick; and connector means carried by the guide means and having one end secured to the rib adjacent the free end thereof and the other end secured to the rib at a point between the pivoted end and the stretcher connection and having such a length as to be taut when the rib is in extended position whereby upward pressure on the outer end of the rib produces a downward pressure on the inner end portion of the rib.

2. In an umbrella, a stick; a rib having one end pivotally mounted on the stick; a stretcher for the rib having one end pivotally connected to the underside of the rib intermediate the ends thereof, said stretcher moving the rib to extended position; guide means on the stick; and a flexible connector slidable in the guide means and having one end secured to the rib adjacent the free end thereof and the other end secured to the rib at a point between the pivoted end and the stretcher connection and having such a length as to be taut when the rib is in extended position whereby upward pressure on the outer end of the rib produces a downward pressure on the inner end portion of the rib.

3. In an umbrella, a stick; a rib having one end pivotally mounted on the stick; a stretcher for the rib having one end pivotally connected to the underside of the rib intermediate the ends thereof and dividing the rib into an inner and outer portion, said rib having a pair of eyes thereon, one on the outer portion adjacent the free end of the rib and the other located on the inner end portion of the rib; fixed guide means and a flexible connector slidable in the guide means and having the ends thereof secured to the eyes on the rib and having such a length as to be taut when the rib is in extended position and to apply a downward pressure on the inner end portion of the rib when an upward pressure is applied to the outer end of the rib.

4. An umbrella comprising a stick; a plurality of ribs; means pivotally mounting one end of each rib to the stick adjacent one end thereof; a runner slidable on the stick between a lower and an upper position; a plurality of stretchers, each having one end pivotally connected to the runner and the other end pivotally connected to the underside of one of the ribs intermediate the ends thereof, said stretchers moving the ribs to extended open position upon movement of the runner on the stick to its upper position; means holding the runner in its upper position; guide means

on the stick located between the upper position of the runner and the rib mounting means; and flexible connectors passing through the guide means, each having one end secured to a rib adjacent the free end thereof and the other end secured to a rib at a point between the pivoted end and the stretcher connection and having such a length as to be taut when the ribs are in extended position.

5. An umbrella comprising a stick; a plurality of ribs; means pivotally mounting one end of each rib to the stick adjacent one end thereof; a runner slidable on the stick between a lower closed position and an upper open position; a plurality of stretchers, each having one end pivotally connected to the runner and the other end pivotally connected to the underside of one of the ribs intermediate the ends thereof, said stretchers moving the ribs to extended position upon upward movement of the runner on the stick to its upper position; means holding the runner in its upper position; guide means secured to the stick between the upper position of the runner and the rib mounting means; and flexible connectors slidable in the guide means, each having one end secured to the rib adjacent the free end thereof and the other end secured to the rib at a point between the pivoted end and the stretcher connection and having such a length as to be taut when the ribs are in extended position, said guide means being located on the stick above the ends of the flexible connectors to form a loop in the flexible connectors to maintain the connectors within the umbrella when in closed position.

6. A reinforcing means for an umbrella rib comprising a guide means to be secured to the umbrella stick and a flexible connected slidable in the guide means and having the ends thereof adapted to be connected to the inner and outer portions of the rib respectively at points spaced from the ends thereof and being of a length to be taut when the umbrella is in open position.

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