Dec. 16, 1952 J. MAYER 2,621,669

UMBRELLA

Filed April 21, 1951 2 SHEETS—SHEET 1

Fig. 1

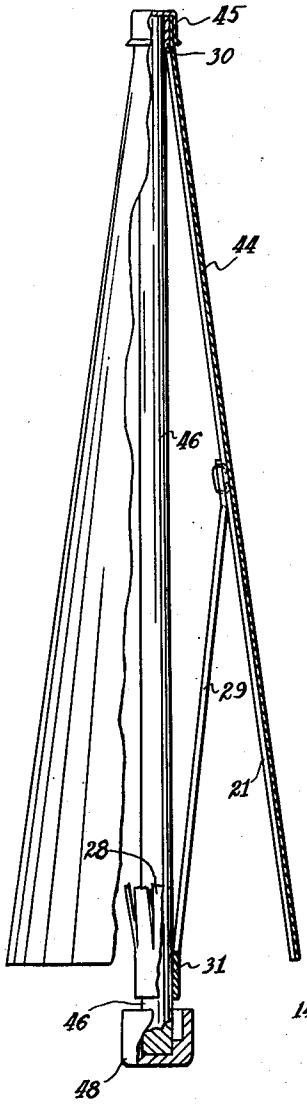


Fig. 2

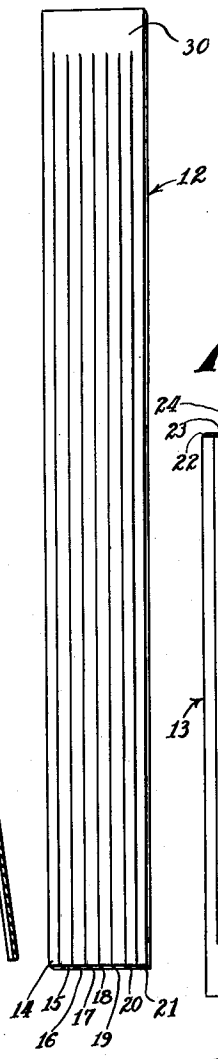


Fig. 3

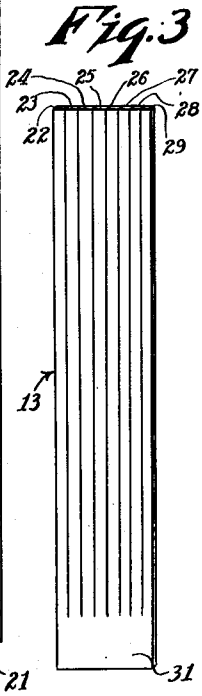


Fig. 4

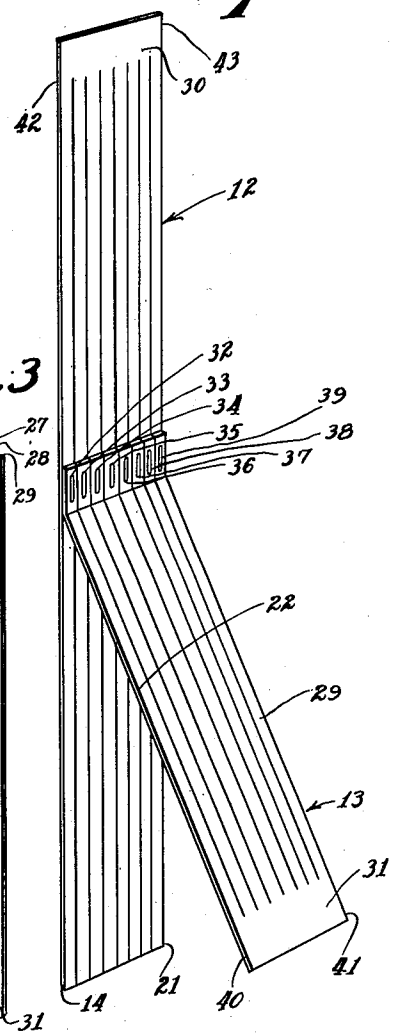
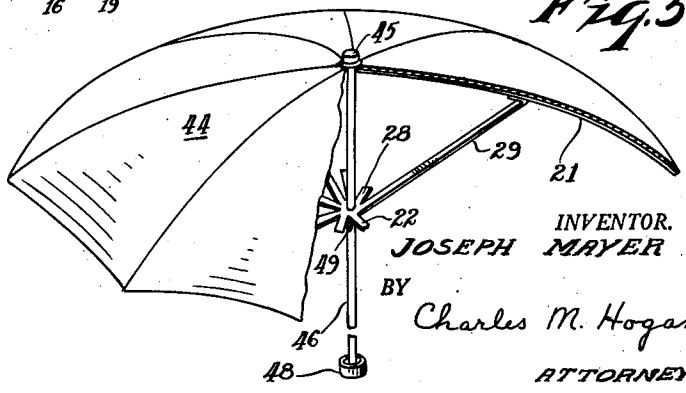


Fig. 5



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UMBRELLA

Filed April 21, 1951 2 SHEETS—SHEET 2

Fig. 6

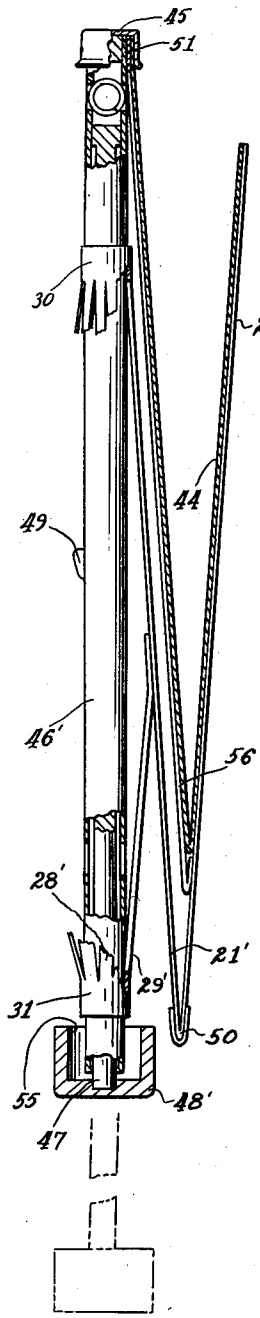


Fig. 7

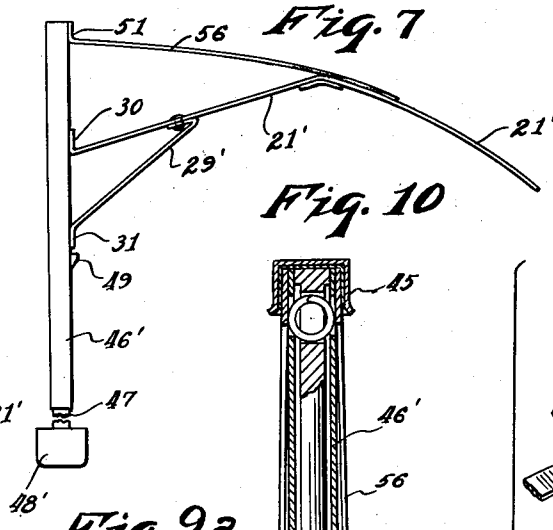


Fig. 9a

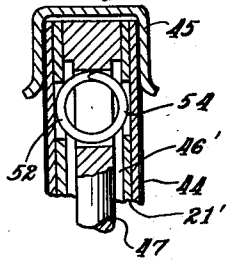


Fig. 9b

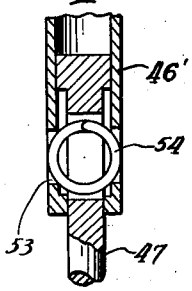


Fig. 9c

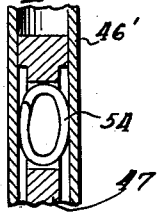


Fig. 10

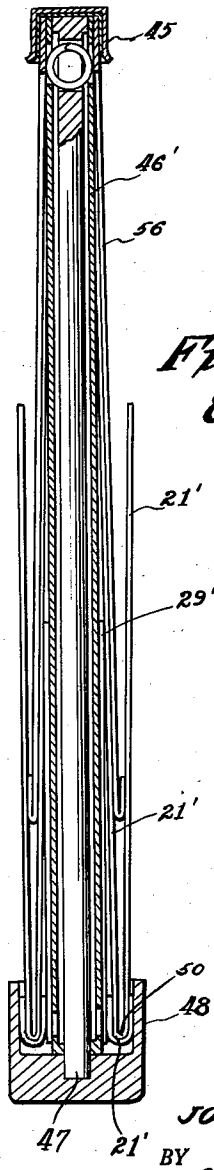
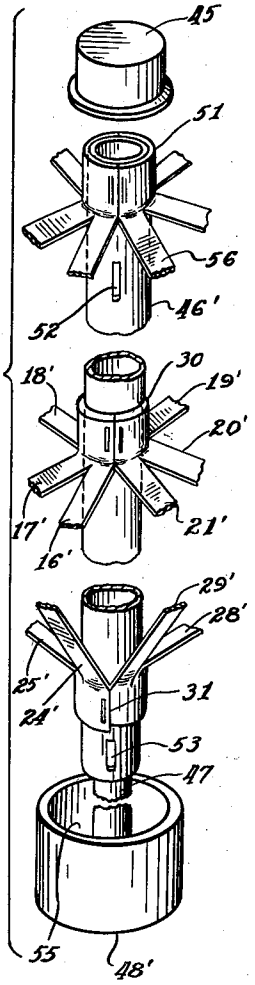


Fig 8



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Patented Dec. 16, 1952

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UNITED STATES PATENT OFFICE

2,621,669

UMBRELLA

Joseph Mayer, Oxford, Ohio

Application April 21, 1951, Serial No. 222,235

7 Claims. (Cl. 135—20)

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The present invention relates to a novel umbrella and a novel process for manufacturing the cover-spreading structure of an umbrella. The invention contemplates the providing of an umbrella of expendable character, adapted to be readily vended, either by machine or according to conventional retail selling methods, but particularly suited to the requirements of persons who have an immediate need for effective and economical protection against rain or snow.

The invention also comprehends an improved pressure rib and spreader rib structure for umbrellas. Coextensive with this object is the providing of a rapid, inexpensive and efficient method of producing this structure.

For a better understanding of the present invention, together with other and further objects, advantages and capabilities thereof, particularly those relating to its advantageous use as a low-cost protection against the elements, reference is made to the following description of the accompanying drawings, in which there are disclosed a preferred illustrative umbrella in accordance with the invention and a modified embodiment thereof. In the drawings:

Fig. 1 is an elevational view of the preferred form of umbrella structure in accordance with the invention, certain parts being broken away to show the interior of the cover and specifically the detail of one pressure rib and spreader rib articulation, the remaining seven articulations being omitted, this figure showing the positions of the parts when the pressure rib collar is slightly elevated to begin the opening of the umbrella;

Fig. 2 is a top plan view of the unitary spreader rib structure, inclusive of its integral collar member, the structure being shown as it appears after slitting but before incorporation in the umbrella;

Fig. 3 is a top plan view of the unitary pressure rib structure, complete with its integral collar member, the structure being slitted and shown as it appears before incorporation in the umbrella;

Fig. 4 is a perspective view of the unitary spreader-rib structure of Fig. 2 and the unitary pressure rib structure of Fig. 3 as they appear when stapled into a subassembly, ready for forming into final shape;

Fig. 5 is a perspective view of the umbrella opened ready for use, certain portions of the rib structure and top and handle end of the mast being broken away for full exposition of position of the umbrella structure when in use;

Fig. 6 is an elevational view of a modified embodiment of the umbrella in accordance with the

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invention, showing in full lines the positions assumed by the parts when opening of the umbrella has progressed very slightly;

Fig. 7 is an elevational view showing the positions of a typical spreader rib, pressure rib and brace rib when the modified embodiment is in its open position;

Fig. 8 is an exploded view showing certain of the parts of the modified embodiment in their normal vertical relationships, to wit: the cap, the brace rib collar, the spreader rib collar, the pressure rib collar, the inner stem, the outer tube or mast and the handle, all in the relative positions assumed when the umbrella is open.

Figs. 9*a*, 9*b* and 9*c* are central sectional views taken on a plane passing through the longitudinal axis of the Fig. 6 umbrella showing the relative relationships of the handle, the stem, the outer tube or mast and the locking ring when the umbrella is closed, when it is open, and when it is partially open, respectively; and

Fig. 10 is an elevational sectional view taken on a plane passing through the longitudinal axis of the umbrella according to Fig. 6, showing the positions assumed by the parts when the umbrella is closed.

Referring now specifically to Figs. 1 through 5, in which the preferred embodiment of the invention is illustrated, the first step in the manufacturing process according to the invention is to form two strips of tough but bendable material into the shapes illustrated in Figs. 2 and 3. Cardboard has been found to be adequate, but many of the synthetic resins and plastic materials now available are even more satisfactory. The invention is not confined to a narrow or particular set of parameters but pieces of cardboard material having a thickness of $\frac{1}{16}$'' and a width of 1½'' in lengths respectively of 18¾'' and 10¼'' for the spreader rib and pressure rib structures have been found satisfactory. All dimensions and materials mentioned herein are given for purposes of illustration and not of limitation. The spreader rib structure is collectively designated by the reference numeral 12 and the pressure rib structure is indicated by the reference numeral 13. Each of the structures is slitted throughout the greater part of its length to provide the spreader ribs numbered 14 through 21 in Fig. 2 and the pressure ribs numbered 22 through 29 in Fig. 3. The integral collar portion 30 at one end of the spreader rib structure is not slitted and a width of ¾'' has been found adequate for collar 30. Similarly the collar portion 31 of the pressure rib structure is not slitted.

It will, of course, be understood that each rib may be stiffened if desired by the stamping of longitudinal grooves thereon or by some equivalent process. The free end of each pressure rib is secured in abutment with the approximately central portion of each associated spreader rib in the manner illustrated in Fig. 4, as by the staples numbered 32 through 39, inclusive, or by some equivalent expedient. It is within the scope of the disclosure and appended claims first to secure the pressure rib strip to the spreader rib strip, by a plurality of staples or equivalent means, and thereafter to slit the strips to provide the ribs 14 to 21 and 22 to 29. The Fig. 4 structure is then placed on the rod or mast 46, which preferably is made of soft wood or other suitable material. The rod 46 is disposed alongside and placed in abutment with the Fig. 4 structure and the collars 30 and 31 are formed into split rings. Collar 31 is slidably mounted on and in concentric relation to the rod 46. Collar 30 is fixed or secured in rigid embrace to the top margin of rod 46. The edges 40 and 41 of member 31 are secured together to form the manually manipulated pressure rib collar and the edges 42 and 43 of member 30 are appropriately secured together to form the spreader rib collar, the latter then being fixed on rod 46 by any suitable expedient such as cementing. The inner margin of the canopy or cover 44, which preferably is of any suitable light plastic material, is tightly compressed between the collar 30 and the interior of an upper cap member 45. Further security may be afforded by cementing the cap in place and by cementing the inner margin of the cover to the collar 30. Suitably pressed onto the end of rod 46 is a handle 48. When it is desired to use the umbrella the owner simply grasps and elevates collar 31 until it snaps into position over a spring 49 located upwardly on rod 46, the details of such a spring being well known and disclosed in U. S. Patent 1,547,538 to Vincent, for example.

In order to visualize how the Fig. 4 structure is shaped into an umbrella frame, let it be assumed that the structure as shown in Fig. 4 is axially rotated clockwise through approximately 90°, bringing the elements 29 and 21 into the aspect shown in Fig. 1. Let it next be assumed that portions 30 and 31 are placed in abutment with mast 46. Collar 31 is then wiped or curved around the lower part of the mast in a direction away from ribs 14 through 21, which thereupon tend to spread out. Collar 30 is similarly wiped or curved around the top margin of the mast in the same direction.

The cover 44 is secured to each of the spreader ribs 14 through 21 by eyelet staples or other appropriate expedient such as cement or adhesive, as shown in U. S. Patent 1,924,426 to Williams.

The details of the slitting of the unitary structures 12 and 13 need not be amplified because appropriate manufacturing methods for slitting per se have been known as early as the issuance of U. S. Patent 1,693,948 to Fabbrin on December 4, 1928.

Refinements contemplate the stapling of collar 30 to rod 46 and the embrace of the sliding collar 31 by binding tape or the like. The scope of the invention is not limited by such refinements or by the specific materials herein discussed.

The embodiment of Figs. 1 through 5 having been described in detail, the description now proceeds to a discussion of the embodiment illustrated in Figs. 6 through 10. For purposes of simplification and clarification there are utilized in the latter figures the identical reference numerals for like elements and corresponding reference numerals are primed to indicate similar elements.

The Fig. 6 embodiment has six pressure ribs and spreader ribs, respectively numbered 24' through 29' and 16' through 21', the pressure ribs being substantially identical to those hereinabove described. The spreader ribs numbered 16' through 21' are similar to those above described, but are bent normally upwardly at the midpoint in each instance, as indicated by the reference numeral 50, when the umbrella is in its closed position. The cover 44 is secured only to the outer portion of each spreader rib such as 21' outwardly of the bend, as indicated in Fig. 6. Upward movement of the pressure rib collar 31 elevates each of the spreader ribs into the position indicated in Fig. 7. In addition to the spreader ribs and the pressure ribs there are provided six brace ribs (one of which is shown in Fig. 7 and indicated by reference numeral 56). The unitary structure of the brace ribs and collar 51 (Fig. 8) is formed in the same manner as the spreader rib structure illustrated in Fig. 2, it being understood that the brace ribs are somewhat shorter than the spreader ribs. The free end portion of each brace rib is given an initial reversed bend as shown in Fig. 6 and the bent portion is stapled or otherwise suitably secured to the associated spreader rib such as 21'. The cover 44 and the brace rib collar 51 are rigidly secured to the top of the mast 46' by the crown or cap 45 and the cover 44 is secured to each brace rib. The spreader rib collar 30 is fixed to the mast 46 at a point approximately a quarter-length removed from the top of the mast. Elevation of the pressure rib collar 31 causes the opening out of the spreader ribs into the position illustrated in Fig. 7 and the cooperative action of the spreader ribs and the brace ribs is such that the spreader ribs flex outwardly and assume the position illustrated in Fig. 7. In this embodiment the mast is formed as a tube 46', made of a stiff plastic material or cardboard. Telescopically slidably mounted within tube 46' is a wooden stem 47, to the lower end of which is secured a handle 48'. The tube 46' is apertured near its ends as illustrated by the reference numerals 52 and 53, respectively, in Figs. 9*a* and 9*b*, and the upper portion of the stem 47 carries a split pressure ring 54 which snaps outwardly into either set of apertures, as desired, to maintain the handle in the closed position illustrated in Fig. 10 or in the withdrawn or open position. In Fig. 6 there is shown in dashed outline the manner of withdrawing the stem 47 and handle. The handle may optionally be provided with an annular depression 55 into which the bent midportions of the spreader ribs may be tucked when the umbrella is in the closed position.

It will be seen that the invention provides a particularly compact umbrella of very economical construction. These umbrella structures are easily handled by vending machines and can be stored in large quantities in a relatively small space. They are appropriately shaped to be placed side by side in quantity.

Where there have been shown and described what are at present considered to be the preferred embodiments of the invention, it will be obvious to those skilled in the art, that various modifications and substitutions of equivalents may be made therein without departing from

the true scope of the invention as defined by the appended claims.

Having fully described my invention, I claim:

1. In an umbrella, a cover-spreading structure comprising a mast, a collar secured to the top of the mast, expandable spreader ribs severally extending from but integral with said collar and manually operable means for elevating said ribs to a position of substantial angularity relative to said mast or depressing said ribs into substantial parallelism with said mast.

2. In an umbrella of the type including a cover, a mast, and spreader ribs for opening out the cover, a device for elevating or depressing the spreader ribs comprising a unitary structure having a collar slidably mounted on the mast and a plurality of pressure ribs integral with said collar but severally extending therefrom and individually secured to said spreader ribs.

3. In an umbrella, a unitary spreader rib structure comprising a collar and integral spreader ribs severally extending from said collar.

4. The method of forming a spreader rib and pressure rib structure for an umbrella which comprises the steps of longitudinally plural slitting relatively long and short strips of tough but bendable material throughout the major portions of their lengths to provide spreader ribs and pressure ribs, then securing the free end of each pressure rib substantially to the midportion of each spreader rib, and finally forming the unslit portion of said strips into circular collars.

5. An umbrella comprising a mast, a collar secured to the mast and having integral spreader ribs severally diverging therefrom, a second collar slidably mountable on and in concentric relationship with the mast and having integral pressure ribs severally diverging therefrom, the free end of each pressure rib being secured to an inner surface of a spreader rib, and a canopy secured to the outer surface of said spreader ribs.

6. The method of forming a spreader rib and pressure rib structure for an umbrella which comprises the steps of securing an end of a relatively short piece of tough but bendable material to a relatively long piece of similar material, securing said pieces together at a plurality of zones, then slitting said pieces throughout the major portions of their lengths to provide pressure ribs and spreader ribs each one zone in width.

7. An umbrella in accordance with claim 5 and a crown secured to the top of a mast for rigidly holding the inner margin of the canopy and the spreader rib collar and the mast in rigid assembly.

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