March 30, 1965 J. KAFKA 3,175,568

TILTABLE UMBRELLA CONSTRUCTION

Filed July 18, 1961 2 Sheets-Sheet 1

Fig.1

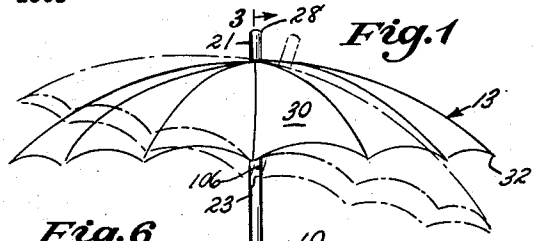


Fig.2

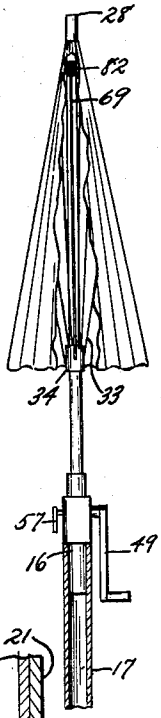


Fig.3

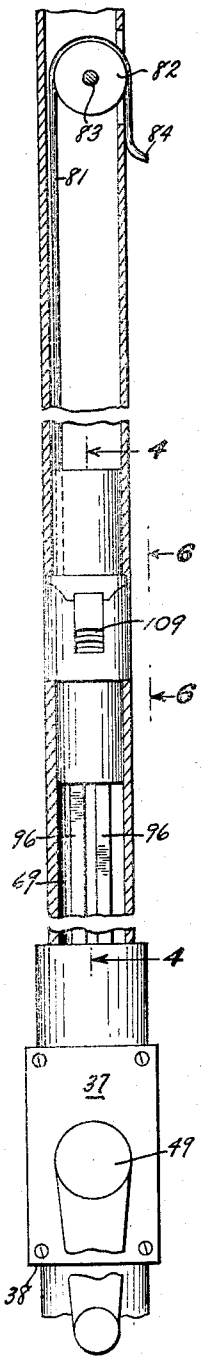
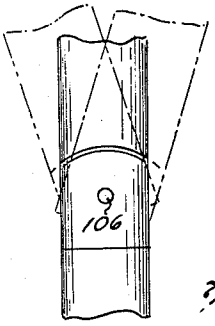


Fig.6



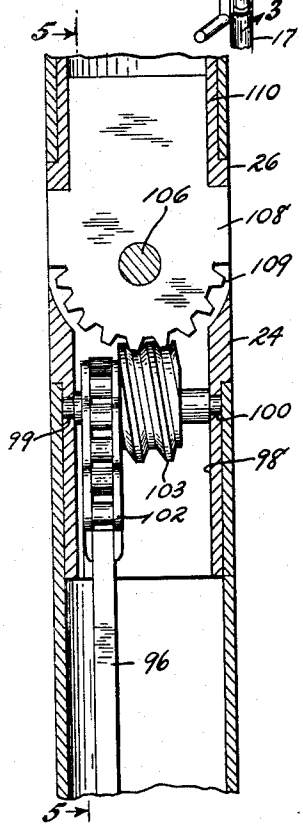


Fig.4

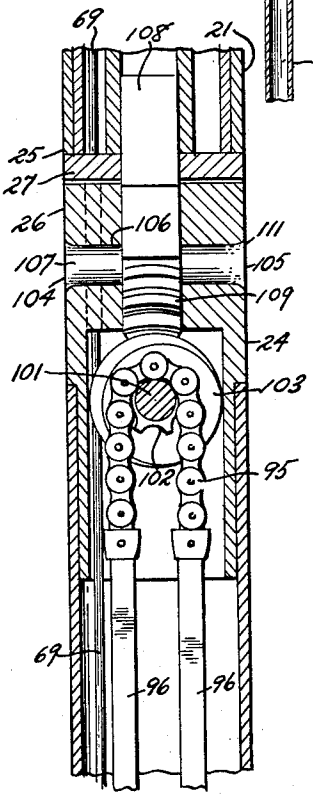


Fig.5

March 30, 1965 J. KAFKA 3,175,568

TILTABLE UMBRELLA CONSTRUCTION

Filed July 18, 1961 2 Sheets-Sheet 2

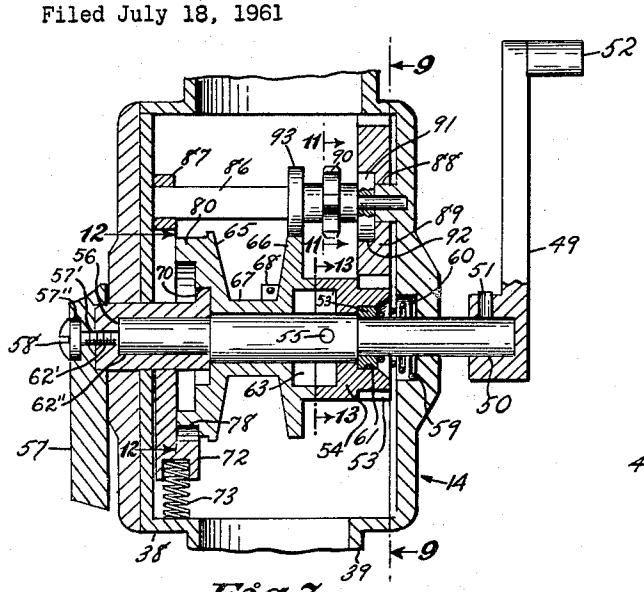


Fig. 7

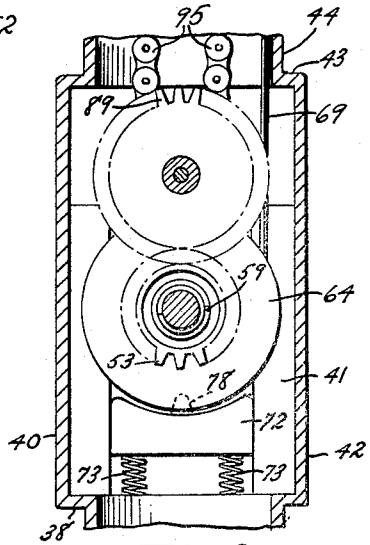


Fig. 9

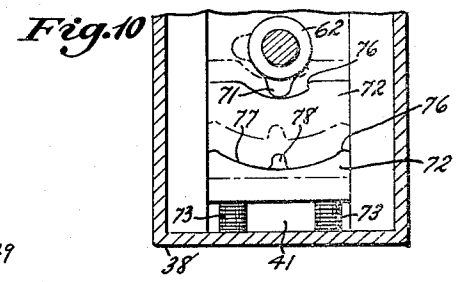


Fig. 10

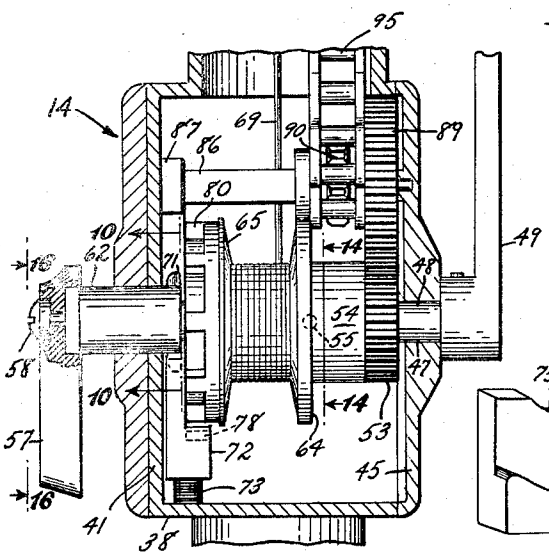


Fig. 8

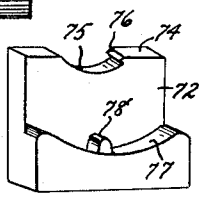


Fig. 15

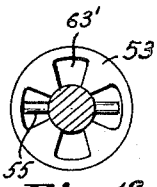


Fig. 13

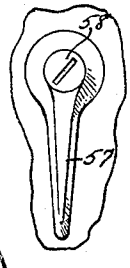


Fig. 16



Fig. 11

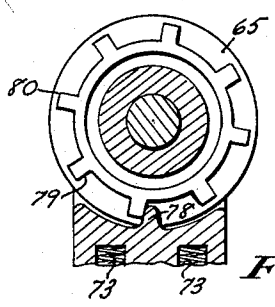


Fig. 12

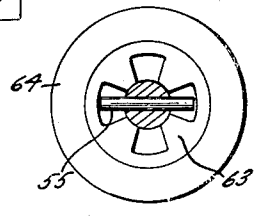


Fig. 14

United States Patent Office 3,175,568 Patented Mar. 30, 1965

3,175,568

TILTABLE UMBRELLA CONSTRUCTION

Jack Kafka, 108 Glen Cove Ave., Glen Cove, N.Y.

Filed July 18, 1961, Ser. No. 124,912
2 Claims. (Cl. 135—20)

This invention relates generally to the field of large size tiltable umbrellas, of the type used in gardens, on beaches, and other outdoor installations. Devices of this type are generally known in the art, and the invention lies in specific constructional details facilitating convenient operation while requiring a minimum of effort on the part of the user.

Devices of this type are characterized in the provision of a first or lower shaft element engageable with the ground or other support, and a second or upper shaft element pivotally associated at the lower end thereof to the upper end of the first shaft element, and means for erecting the umbrella and maintaining it in erected condition, together with separate means for moving the upper shaft element to a tilted position and maintaining the same thereat. In more advanced constructions, the umbrella is erected by the turning of a crank which tenses a cable trained about a pulley on the upper shaft element, and connected to a sliding collar which expands the shade in a usual manner. Means is provided for locking the position of the crank to maintain tension upon the cable, and the shade element in erected condition. Other and separate means is usually provided for the movement of the upper shaft element to an angularly disposed position with respect to the lower shaft element which is normally supported in a vertical condition. The preferred means includes a generally horizontally disposed pin trunnioned in support means on the upper end of the lower shaft, and rack and sector means for accurately positioning the upper shaft with respect to its angular disposition.

As a result of the above complexity, the umbrella in installed condition has assumed an unattractive appearance owing to the presence of many exposed mechanical linkages, and the manual dexterity required to operate such devices has often been beyond the skill or physical strength of the user.

It is therefore among the principal objects of the present invention to provide an improved tiltable umbrella of the class described in which the above-mentioned disadvantages have been substantially eliminated.

Another object of the invention lies in the provision of an improved tilting umbrella of the class described in which all movement is accomplished by the imparting of movement to a single readily accessible crank member, which, operating in conjunction with an adjustable clutch-engaging member, allows motion to be transmitted which results either in erecting the shade element of the umbrella or tilting the upper shaft with respect to the lower shaft.

Another object of the invention lies in the provision of structure of the class described, and possessed of the above advantages, in which the cost of fabrication may be of a reasonably low order, consistent with prior art devices, thereby permitting consequent wide sale, distribution and use.

Still another object of the invention lies in the provision of tiltable umbrella operating means which may be fabricated largely from die castings which require little or no machining operations prior to assembly, and which may be readily replaced should the occasion arise.

A further object of the invention lies in the provision of improved tilting umbrella construction which may be fabricated using substantially non-corrosive metals, whereby the device may be exposed to the elements over extended periods without deleterious effect.

A feature of the invention lies in the fact that the operating controls are positioned in the lower or vertically fixed shaft element so as to be at a height readily accessible to persons of below average stature without uncomfortable reaching.

Another feature of the invention lies in the high mechanical advantage obtained employing the disclosed linkages employed for erecting and tilting the umbrella, whereby the operation of the same may be substantially effortless.

Still another feature of the invention lies in the provision of means whereby the umbrella shade may be tilted through an angular displacement of 180°, whereby adjustment during the course of a single day does not require movement of the vertical post element supporting the shade.

These objects and features, as well as other incidental ends and advantages, will more fully appear in the progress of the following disclosure, and be pointed out in the appended claims.

In the drawings, to which reference will be made in the specification, similar reference characters have been employed to designate corresponding parts throughout the several views.

FIGURE 1 is a fragmentary view in perspective of an embodiment of the invention.

FIGURE 2 is a side elevational view of the embodiment, showing the shade element thereof in relatively collapsed condition.

FIGURE 3 is a fragmentary vertical longitudinal sectional view as seen from the plane 3—3 in FIGURE 1.

FIGURE 4 is a fragmentary enlarged vertical sectional view as seen from the plane 4—4 in FIGURE 3.

FIGURE 5 is a fragmentary vertical sectional view as seen from the plane 5—5 in FIGURE 4.

FIGURE 6 is a fragmentary elevational view as seen from the plane 6—6 in FIGURE 3.

FIGURE 7 is a vertical enlarged fragmentary sectional view as seen from the plane 7—7 in FIGURE 1.

FIGURE 8 is a fragmentary vertical sectional view corresponding to that seen in FIGURE 7, but showing certain of the component parts in altered relative positions.

FIGURE 9 is a fragmentary vertical longitudinal sectional view as seen from the plane 9—9 in FIGURE 7.

FIGURE 10 is a fragmentary vertical sectional view as seen from the plane 10—10 in FIGURE 8.

FIGURE 11 is a fragmentary vertical sectional view as seen from the plane 11—11 in FIGURE 7.

FIGURE 12 is a fragmentary vertical sectional view as seen from the plane 12—12 in FIGURE 7.

FIGURE 13 is a vertical sectional view as seen from the plane 13—13 in FIGURE 7.

FIGURE 14 is a vertical sectional view as seen from the plane 14—14 in FIGURE 8.

FIGURE 15 is a view in perspective of a resiliently mounted pawl member comprising a part of the embodiment.

FIGURE 16 is a fragmentary side elevational view as seen from the plane 16—16 in FIGURE 8.

In accordance with the invention, the device, generally indicated by reference character **10**, comprises broadly: a lower shaft element **11**, an upper shaft element **12**, a shade element **13**, and combination elevating and tilting means **14**.

The lower shaft element **11** is of generally conventional construction, and may be either of hollow tubular construction or as a large solid dowel. It includes an upper end **16** which supports the means **14**, and a lower preferably pointed end **17** engageable with the ground. If desired, the pointed end **17** may be substituted for by any suitable bracket means where installation is with other than the ground.

The upper shaft element **12** is of hollow construction,

and includes a vertically fixed shaft member 20 and a pivotally arranged shaft member 21. The vertically fixed shaft member 20 includes a lower end 22 and an upper end 23 mounting a supporting bracket 24 to be described in greater detail hereinafter. The pivotally arranged shaft member 21 includes a lower end 25 having a corresponding supporting bracket 26 interconnected to the supporting bracket 24 by transverse pin means 27. The upper end 28 may be of rounded configuration in the interest of safety, as is well-known in the art.

The shade element 13 is generally conventional, including a cloth shade 30 or one of other flexible, suitably durable material, the outer peripheral edges 31 of which are supported by spreading bows 32 maintained in erected condition by spreading arms 33, the lower ends of which are interconnected with a slidable collar 34 surrounding the shaft member 21.

The combination elevating and tilting means 14 interconnects the upper and lower shaft elements 11 and 12, and includes a generally rectangular housing 37 having a bottom wall 38 from which extends a cylindrical boss 39. Three side walls 40, 41 and 42 support a top wall 43 having a corresponding cylindrical boss 44 thereupon. A removable cover plate 45 is secured to the opening defined by the walls 38, 40–43, and is supported thereon by threaded or other suitable means (not shown). The cover plate 45 is provided with a generally centrally disposed opening 47 which acts as a bearing for a shaft 48 extending therethrough. The outer end of the shaft supports a crank member 49 having a non-circular bore 50 shaped to correspond with the shaft end, and maintained thereon by set screw means 51. The crank handle 52 is of conventional form, and serves as motion-imparting means.

Disposed inwardly of the opening 47 is a gear 53 integral with a clutch-driven member 54 (see FIGURES 13 and 14), a pintle 55 serving the purpose of clutch-engaging means, selectively pinning the gear 53 with respect to the shaft 48, as the shaft is shifted axially between first and second positions.

The opposite end 56 of the shaft 48 supports a clutch-operating lever 57 and a clutch-engagement locking member 62, the former being mounted directly upon the latter, and the latter upon the end 56. The lever 57 has a through bore 57′ with a seat 57″ to receive a screw 58. The locking member 62 also has a through bore 62′ to receive the screw 58. The shank of the screw is received within the bores 57′ and 62′, both of which are threaded; but the shank is shorter than the combined length of the two bores, stopping short of an inner cylindrical chamber 62″. The end 56 is received within the chamber 62″ abutting the end wall thereof, supporting the locking member 62 and lever 57, but is also capable of rotary motion within the chamber. A clutch spring 59 (see FIGURE 7) extends partially into a recess 60 in the cover plate 45, and partially into a recess 61 in the clutch-driven member 54. The pintle 55 is selectively engageable with two of a plurality of locking projections 63 on a clutch-driven cable drum member 64, the member 64 also including first and second flanges 65 and 66, respectively, interconnected by a hub portion 67 and two of a plurality of perforations 63′ in gear 53. Cable anchoring means 68 engages the end of a cable 69 which winds about the hub portion 67.

From a comparison of FIGURE 7 with FIGURE 8, it will be observed that the pintle 55 which serves as motion output means will at all times be engaged with the shaft 48 through which it extends, and with either the clutch-driven member 54 which includes the gear 53, or the cable drum member 64, depending upon the relative axial position of the shaft 48. Disposed in the first flange 65 is a recess 70 in which a projection 71 of the clutch-engagement locking member 62 is selectively disposed. Supported for sliding movement between the outer surface of the flange 65 and the inner surface of the side wall 41 is a pawl member 72 which rests upon springs 73 (see FIGURE 15). The upper surface 74 of the member 72 is provided with a declivity 75 and a stop projection 76 (see FIGURE 10). An intermediate surface 77 includes a projection 78 engageable within recesses 79 in a ratchet 80 (see FIGURE 12) integrally cast with the flange 65.

Referring to FIGURE 3, the upper portion 81 of the cable 69 is trained over a pulley 82 arranged for rotation about a horizontally disposed pintle 83, the end 84 of the cable being secured to the collar 34.

Referring to FIGURES 7, 8 and 9, a horizontally disposed shaft 86 is supported for rotation in bosses 87 and 88, the shaft 86 supporting a gear member 89 which meshes with gear 53. A toothed sprocket member 90 includes a non-circular integrally formed member 91 engaging a socket 92 in the gear 89, for the transmission of motion therethrough. A free-turning bearing 93 is also supported by the shaft 86, and counteracts non-axial torque on the shaft 48 by contact with the second flange 66. Engaged with the sprocket wheel 90 is a sprocket chain 95, which extends upwardly within the upper shaft element 12. As best seen in FIGURES 4 and 5, parts of the chains 95 may be substituted by cable segments 96 in the interests of lower cost of production.

The supporting bracket 24 includes a downwardly projecting boss 98 having aligned bores 99 and 100 which support a horizontally disposed shaft 101 engageable therewith. The shaft 101 supports a sprocket wheel 102 about which the chain 95 is entrained, and a worm 103. The bracket 24 also includes opposed trunnions 104 and 105 supporting a horizontal pintle 106 in bores 107 and 111, and supporting the bracket 26. The bracket 26 includes a lower portion 108 having a gear sector 109 engaged with the worm 103 for the transmission of motion therethrough. A projecting upper boss 110 engages the shaft member 21.

Operation of the device will be readily understood from a consideration of FIGURES 4, 5, 7, 8 and 9. At the commencement of erection of the shade element 13, the means 14 is placed in the position shown in full lines in FIGURE 8, which engages the crank member 49 with the cable drum member 64. In this position, the member 62 is out of engagement with respect to the pawl member 72, the projection 71 bearing down upon the declivity 75 and being restrained in positions therein by the restriction of further progress by the stop 76 of the member 72 and depressed against the springs 73 and operating in a normal manner as indicated in FIGURE 10. The crank member 49 is then rotated, resulting in tensioning of the cable 69 and erection of the shade element. Upon completion of this operation, and where it is desired to adjust the degree of tilt of the member 21, the shaft 48 is shifted rightwardly as seen in FIGURE 7, wherein the projection 71 of the locking member 62 is removed from the declivity 75 and is securely seated within a corresponding seat in the recess 70, and the pintle 55 will engage the clutch-driven member 54 and integral gear 53. Upon the occurrence of the rotation of the locking member 62 and the shifting of the shaft 48, the pawl member 72 will move upwardly due to the springs 73 and move into engagement within the recesses 79 of the rachet 80, by the projection 78 and will retain tension upon the cable 69 to prevent collapse of the shade element. The crank member 49 may now transmit motion to the sprocket wheel 90 through the gear 89, and subsequently to the worm 103 and gear sector 109. In lowering or collapsing the shade element 13, returning the shaft 48 to the position shown in FIGURE 8 requires a shifting of the locking member 62, and rotation of the same by operating lever 57 to the point where the projection 71 contacts the surface 74 to depress the pawl member 72 permitting reverse rotation of the drum member 64. This can occur only after the crank member 49 has been reengaged with the drum member 64, so that accidental collapse of the

shade element **13** cannot occur during normal operation.

I wish it to be understood that I do not consider the invention limited to the precise details of structure shown and set forth in this specification, for obvious modifications will occur to those skilled in the art to which the invention pertains.

I claim:

1. Combination elevating and tilting means for use in conjunction with a tiltable umbrella comprising: a housing, a first shaft having a principal axis and supported for rotation within said housing, and for limited axial movement between first and second positions, motion imparting means interconnected to one portion of said shaft, clutch means fixed for rotation with said shaft, cable winding means supported for rotation with respect to said shaft and having means selectively engageable with said clutch means, secondary motion output means mounted upon said shaft and alternately engageable with said clutch means during the period in which the same is disengaged with respect to the clutch-engaging means on said cable winding means, resilient pawl means disposed within said housing, ratchet means on said cable winding means engageable with said pawl means, means disengaging said pawl means with respect to said ratchet means mounted upon said shaft, said last-mentioned means being engageable with said pawl means only upon the engagement of said clutch means with said cable winding means.

2. In a tiltable umbrella construction, including a tiltable shaft member and a shade element, improved elevating and tilting means comprising: a housing, a first shaft having a principal axis and supported for rotation within said housing and for limited axial movement between first and second positions, motion imparting means interconnected to one portion of said shaft, clutch means fixed for rotation with said shaft, cable winding means

supported for rotation with respect to said shaft and having means selectively engageable with said clutch means, secondary motion output means mounted upon said shaft and alternately engageable with said clutch means during the period in which the same is disengaged with respect to the clutch-engaging means on said cable winding means, resilient pawl means disposed within said housing, ratchet means on said cable winding means engageable with said pawl means, means disengaging said pawl means with respect to said ratchet means mounted upon said shaft, said last-mentioned means being engageable with said pawl means only upon the engagement of said clutch means with said cable winding means, cable means tensed by said cable winding means serving to erect said shade element means connecting said cable means and said shade element, and means communicating with said secondary motion output means for tilting said tiltable shaft member.

References Cited by the Examiner

UNITED STATES PATENTS

329,244	10/85	Walker et al.	
2,475,406	7/49	Russell	135—46
2,561,139	7/51	Sasgen.	
2,595,697	5/52	Pereira	135—20
2,610,826	9/52	Heller.	
2,614,836	10/52	Williams	192—67 X
2,721,569	10/55	Militano	135—46 X
2,914,154	11/59	Russell	135—20 X
2,951,492	9/60	Small	135—20

HARRISON R. MOSELEY, *Primary Examiner.*

J. D. SEERS, *Examiner.*