

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TREASURE GARDEN, INC.,
Petitioner,

v.

ATLEISURE, LLC,
Patent Owner.

Patent No. 8,104,492

DECLARATION OF DR. RICHARD W. KLOPP, Ph.D., P.E., F.A.S.M.E.

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I. INTRODUCTION

1. My name is Richard W. Klopp, and I reside in Redwood City, CA. I am a Principal Engineer in the Mechanical Engineering Practice at Exponent, Inc. I am over eighteen years of age, and I would otherwise be competent to testify as to the matters set forth herein if I am called upon to do so.

2. I have been retained by Treasure Garden, Inc. (“Petitioner”) in connection with the above-captioned petition for *inter partes* review (“IPR”) of U.S. Patent No. 8,104,492 (the “’492 Patent” or the “the Challenged Patent,” Ex. 1001). The ’429 Patent will be cited herein as “Ex. 1001” with additional column, line, and similar references to specific portions. I understand the ’492 Patent is currently assigned to ATLeisure, LLC (“Patent Owner”).

3. I have been asked to provide my opinion as to whether claims 1-7 of the ’492 Patent (which I will refer to collectively as the “Challenged Claims”) would have been anticipated by certain prior art. I have also been asked to provide my opinion as to whether the Challenged Claims would have been obvious to a person of ordinary skill in the art (“POSITA”) at the time of the alleged invention in view of the prior art.

4. In forming my opinions, I rely on my knowledge, training, and experience as a mechanical engineer and on documents and information referenced in this Declaration.

5. My employer, Exponent, is being compensated by Petitioner at my standard hourly consulting rate of \$720 per hour for my time spent on this matter and is being reimbursed for actual expenses. My compensation is not contingent on the substance of my opinions, on the outcome of the IPR, or on the outcome of any related dispute between Petitioner and Patent Owner.

6. Neither Exponent nor I have a conflict of interest with respect to Petitioner or Patent Owner.

A. Background Expertise

7. I am a Principal Engineer based in Exponent's Menlo Park, California, office. I am a trained mechanical engineer with Professional Engineer licenses in California, Texas, Washington, Michigan, and Nevada. I received my undergraduate degree in mechanical engineering from Lehigh University; master's degrees in engineering and applied mathematics from Brown University; and a Ph.D. in engineering from Brown University. I currently mentor the local high school robotics team, teaching them aspects of mechanical engineering design, metal fabrication, and machine shop practice. I am also a Fellow of the American Society of Mechanical Engineers and have been practicing in the field of mechanical

engineering for more than 40 years. I have specific expertise in mechanical engineering and mechanics, including machine design, product design, solid mechanics, failure analysis, fracture mechanics, and experimental mechanics.

8. I have investigated many incidents and disputes involving numerous consumer products such as fabricated frames, cantilevered frames, winders, pulley assemblies, and tents. I have extensive experience with analyzing the design of these systems. Indeed, my experience with winders and pulley assemblies extends back to my childhood experience with toys in the early 1960s, including a ride-on wooden derrick (crane) that was a favorite of mine and I still own. Additionally, I have extensive experience with stress analysis, mechanical assembly, manufacturing, and reverse engineering. I have provided written analysis and oral testimony in a wide variety of intellectual property matters, including patent infringement and invalidity analyses, trade secret misappropriation, and design patent and trade dress functionality. Venues have included state and U.S. Federal courts, the International Trade Commission, the Patent Trial and Appeal Board, Canadian courts, and seats of international arbitration. My current CV is being submitted as Ex. 1023.

B. Information Considered

9. My opinions are based on my years of training and experience, as well as my investigation and study of the relevant material. I have reviewed the '492

Patent and considered each document listed below as well as any other references cited in this Declaration.

Exhibit No.	Description
1001	U.S. Patent 8,104,492 (the “’492 Patent”)
1002	Prosecution History for the ’492 Patent
1003	Provisional Application No. 61/050,353
1007	Chinese Utility Model Patent No. CN 201001460Y (“Wang ’460”) (Appl. No. ZL 200720106096.5) with Certified English Translation
1009	U.S. Patent No. 6,321,763 (“Ma ’763”)
1010	U.S. Patent No. 6,478,037 (“Tung ’037”)
1011	U.S. Patent No. 5,284,171 (“Liu ’171”)
1013	German Patent Application Publication No. DE20014895U1 (“Bertola ’895”) with Certified English Translation
1015	European Patent Application No. EP1602297 (Ma ’297)
1016	ATLeisure’s N.D.GA Local Rules 6.1 and 6.2 Disclosures in <i>ATLeisure v. Treasure Garden, Inc.</i> , Case No. 1:24-cv-02270-TWT
1017	Oxford Learner’s Dictionary
1018	Bloomsbury English Dictionary
1019	The New Oxford American Dictionary
1020	The American Heritage Dictionary
1023	Klopp C.V.

10. In reaching my opinions, I have considered the viewpoint of a POSITA at the time of the '492 Patent's alleged priority date of May 5, 2008, and the '492 Patent's non-provisional application filing date of May 5, 2009. As explained below, I am familiar with the level of skill of a POSITA regarding the relevant technology at issue as of that time. I consider myself to have been at least a POSITA as of the claimed priority date.

II. LEGAL STANDARDS FOR PATENTABILITY

11. I am not a lawyer. However, I have been informed by counsel of general principles concerning patent law and the analysis of whether a patent claim is valid. I have followed these principles in arriving at my conclusions in this declaration. The sections below set forth my understanding of the legal principles that are relevant to my opinions in this declaration.

12. First, I understand that for a claimed invention to be patentable, among other things, it must be new and not obvious in light of the information known to exist before the invention was made. I understand that the information that is used to evaluate whether an invention is new and not obvious is generally referred to as "prior art," and that in the proceeding for which I am submitting this declaration, the prior art considered is limited to patents and printed publications (e.g., books, articles, product manuals, company publications, etc.).

13. I understand that the “prior art” includes patents and printed publications that existed before the earliest priority date (“effective filing date”) of the patent. I also understand that a patent or a published patent application will be prior art if it was filed before the effective filing date, or for a printed publication, if it was publicly available before that date.

14. I understand that in this proceeding, it is Petitioner’s burden to prove that the Challenged Claims were anticipated by, or were obvious in light of, the prior art by a preponderance of the evidence. I understand that “a preponderance of the evidence” is evidence sufficient to show that a fact is more likely true than it is not true.

15. I understand that the claims of a patent define the scope of the inventions that are protected by the patent. I understand that in this proceeding, the claims must be given the meaning that the terms would have had to a POSITA at the time of the ’492 Patent claimed priority date. The claims so interpreted are then to be evaluated in light of the prior art.

16. I understand that one way prior art may render a claimed invention unpatentable and its associated patent claims invalid is when the prior art can be shown to have anticipated the claim or made the claim “obvious” to a POSITA.¹ My

¹ I am aware that there are other issues that may render patent claims invalid, but those are beyond the scope of this declaration.

understanding of the legal standards for anticipation and obviousness is set forth below.

A. Anticipation

17. I understand that pre-AIA 35 U.S.C. § 102(a), § 102(b), and § 102(e) state:

A person shall be entitled to a patent unless —

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or

...

(e) the invention was described in — (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application

designated the United States and was published under Article 21(2) of such treaty in the English language.

18. I understand that, for an invention claimed in a patent to be found patentable, or to be valid, it must be, among other things, novel compared to the prior art. I understand anticipation requires that each and every element of a challenged claim is present in, or otherwise taught by, a single prior art reference.

B. Obviousness

19. I understand that pre-AIA 35 U.S.C. § 103(a) states “a patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 , if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.”

20. I understand that obviousness may be shown by considering more than one item of prior art, and that the following factors should be considered in analyzing obviousness:

- The scope and content of the prior art;
- The differences between the prior art and the claims at issue;

- The level of ordinary skill in the pertinent art; and
- Objective evidence of non-obviousness.

21. I understand that objective evidence (“indicia”) are factors that may bear on the question of obviousness or non-obviousness, and these factors include whether the claimed invention proceeded in a direction contrary to the accepted wisdom in the field, whether there was a long-felt but unresolved need in the field that was satisfied by the claimed invention, whether others had tried but failed to make the claimed invention, whether others copied the claimed invention, whether the claimed invention achieved any unexpected results, whether the claimed invention was praised by others, whether others have taken licenses to use the claimed invention, whether experts or those skilled in the field of the claimed invention expressed surprise or disbelief regarding the claimed invention, and whether products incorporating the claimed invention have achieved commercial success.

22. In addition, I understand that the obviousness inquiry should avoid relying on hindsight and must adopt the perspective of a POSITA in the relevant art of the patent’s effective filing date. I understand that when conducting an obviousness analysis, I should put myself in the position of a POSITA at the time

the claimed invention was made. Using this perspective, I should not consider what is known today or what is learned from the teaching of the challenged patent.

23. I also understand that under a proper obviousness analysis, any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining prior art elements in the manner claimed. I also understand combining familiar elements according to known methods is likely to be deemed obvious when it yields no more than predictable results. I further understand that the following are other factors that arose from a case called *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727 (2007) may show obviousness:

- a combination that only unites old elements with no change in their respective functions is unpatentable. As a result, the combination of familiar elements according to known methods is likely to be deemed obvious when it yields no more than predictable results.
- a predictable variation of a work in the same or a different field of endeavor is likely to be deemed obvious if a POSITA would be able to implement the variation.
- an invention is deemed obvious if it uses a known technique to improve a similar device in the same way, unless the actual application of the technique would have been beyond the skill of the POSITA. *Id.* at 1731. A key inquiry is whether the improvement is more than the predictable use of prior art elements according to their established functions.
- an invention is deemed obvious if there existed at the time of invention a known problem for which there was an obvious solution encompassed by the patent's claims.
- inventions that were "obvious to try" – chosen from a finite number of identified, predictable solutions, with a reasonable expectation of success - are likely to be deemed obvious.

- known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art.
- an explicit teaching, suggestion, or motivation in the art to combine references, while not a requirement for a finding of obviousness, may be helpful in determining obviousness.

24. Finally, I understand that even if a claimed invention involves more than substitution of one known element for another or the application of a known technique to a piece of prior art ready for improvement, the invention may still be obvious. I also understand that in such circumstances courts may need to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art to determine if the claimed invention is obvious.

III. PERSON OF ORDINARY SKILL IN THE ART

25. I considered several factors to determine the skill level of a POSITA at the time of the '492 Patent's alleged priority date of May 5, 2008 and the '492 Patent's filing date of May 5, 2009, including the types of problems encountered in the art, the solutions to those problems, the pace of innovation in the field, the sophistication of the technology, and the education level of active workers in the field.

26. Based on my knowledge, expertise, and the prior art cited in the '492 Patent, it is my opinion that a POSITA would have had a bachelor's degree in mechanical engineering or physics or a related discipline and at least four years of experience in the design, development, or analysis of mechanical devices, including fabricated frames and winder or pulley assemblies, though additional work experience could substitute for a formal degree, and vice versa.

27. I understand that a POSITA is presumed to know the relevant prior art and is of ordinary creativity, and not an automaton, and is capable of making inferences and combining teachings in the prior art.

IV. THE '492 PATENT

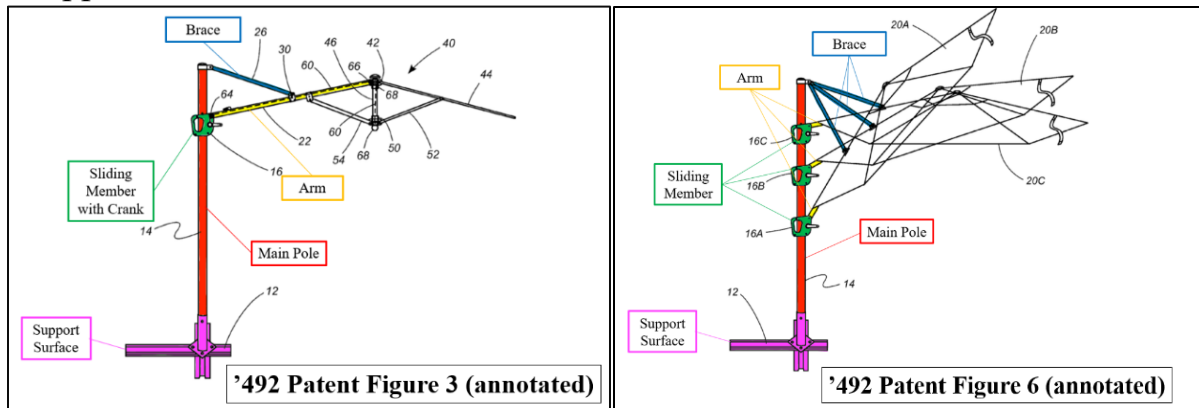
A. Specification and Claims

28. The '492 Patent was issued to Wu Wei Dan on January 31, 2012. The application No. 12/435,640 (the "'640 Non-Provisional Application") that was issued as the '492 Patent, was filed in the U.S. Patent and Trademark Office ("USPTO") on May 5, 2009 and purports to claim priority to Provisional Application No. 61/050,353 (the "'353 Provisional Application") which was filed on May 5, 2008.

29. I have reviewed the '492 Patent and its seven claims. The '492 Patent is directed to an "offset" umbrella with an "improved mechanism for raising and lowering the umbrella canopy and for adjusting the angle of the canopy with respect

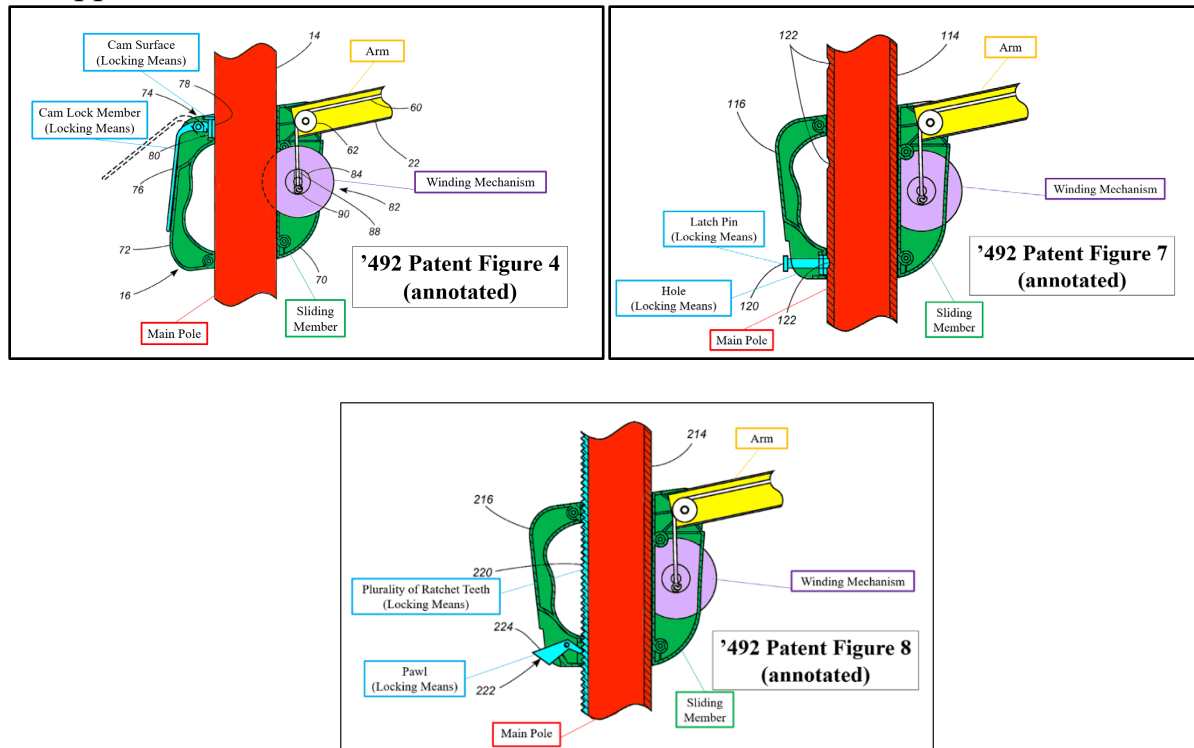
to a vertical support member.” Ex. 1001 at 1:11-16. The ’492 Patent admits that adjustable cantilevered umbrellas were known in the prior art. *Id.* at 1:26-32. These umbrellas used “a cantilever arrangement to suspend the canopy to the side of the main pole,” and the angle of the canopy could be “adjusted with respect to the main pole.” *Id.* at 1:28-32.

30. The ’492 Patent’s purported improvement is a mechanism for adjusting a cantilevered umbrella having a sliding member that moves along the main pole to adjust the angle of the canopy with a winding mechanism mounted to a sliding member for opening and closing the canopy. *Id.* at Figures 3 and 6. To open the canopy, “the user first grasps the crank 92 of the winding mechanism 82 and winds in the line 60. Tension on the line 60 draws ... the opposite end of the line upward, elevating the spreader hub 50. As the spreader hub 50 is raised, the canopy assembly 20 extends.” *Id.* at 3:60-65. Once the canopy assembly “has been fully erected, the user can adjust the angle of the canopy assembly with respect to the main pole 14 by moving the sliding member 16 up or down the pole until the desired result is achieved.” *Id.* at 3:66-4:2. I have annotated Figures 3 and 6 of the ’492 Patent to demonstrate the foregoing.



31. When the canopy is at the desired angle, the sliding member is secured to the main pole at the specific location. The '492 discloses three structures that are “locking means” for securing the sliding member to the main pole at a specific location. *Id.* at 3:25-40 and 4:12-31. These structures, show below, include: 1) a cam lock member mechanism with a lever portion that is pivotally mounted in an upper position of a housing of a sliding member and rotates to its extended position to disengage the cam surface; 2) a latch pin and hole mechanism that uses a stop bolt and a plurality of holes to adjust the height of the umbrella; and 3) a ratchet teeth and pawl mechanism where the row of teeth are arranged on the main pole and interact with a pawl located on the sliding member. *Id.* I have annotated Figures 4, 7, and 8 of the '492 Patent to demonstrate the foregoing.

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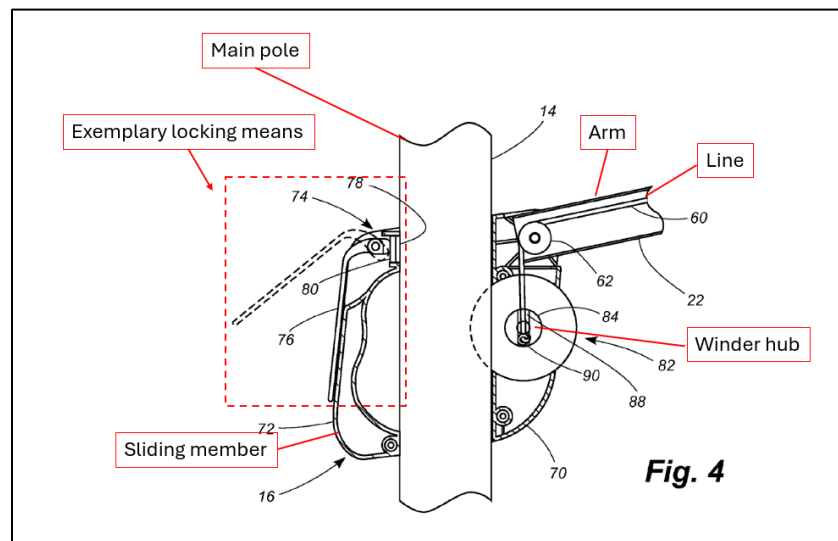


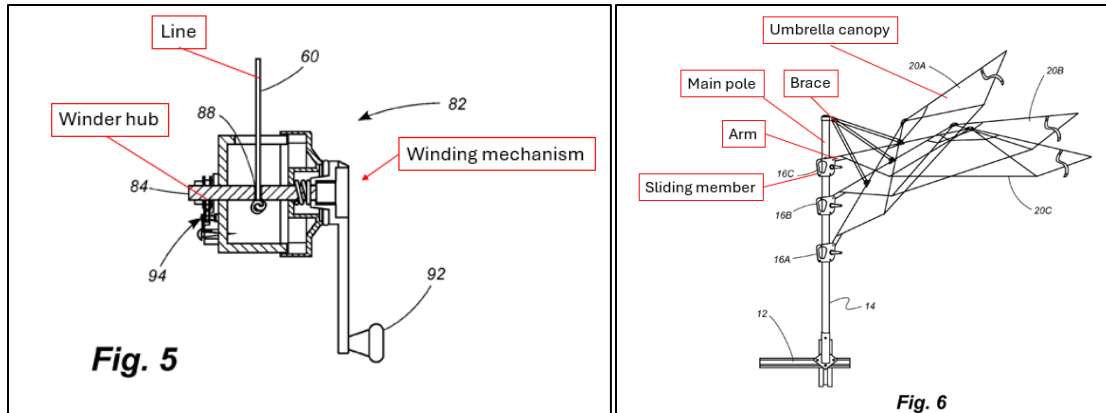
Id. at Figures 4, 7, and 8.

32. The '492 Patent identified problems with prior art cantilevered umbrellas, including that they “utilize a crank mechanism both for raising and lowering the canopy and for adjusting the angle of the canopy. The crank mechanism is mounted to the main pole, and the rope moves along a complex path with many turning points.” *Id.* at 1:33-38. The '492 Patent states that this prior art design” requires more winding force, and the rope can easy [*sic*] bind and wear, adversely affecting the umbrella's operation ... [which make] the operation of the umbrella burdensome and decrease[s] the enjoyment of leisure time.” *Id.* at 1:38:42.

33. To address these issues, the '492 Patent discloses a winding mechanism mounted to a sliding member that allows the user to open and close the umbrella

canopy. The “movement of the sliding member 16 up and down the main pole 14 adjusts the angle of the canopy assembly 20.” *Id.* 3:52-53. To open the canopy, “the user first grasps the crank 92 of the winding mechanism 82 and winds in the line 60. Tension on the line 60 draws ... the opposite end of the line upward, elevating the spreader hub 50. As the spreader hub 50 is raised, the canopy assembly 20 extends.” *Id.* at 3:60-65. Once the canopy assembly “has been fully erected, the user can adjust the angle of the canopy assembly with respect to the main pole 14 by moving the sliding member 16 up or down the pole until the desired result is achieved.” *Id.* at 3:66-4:2. Exemplary annotated Figures 4-6 are shown below.





34. The '492 Patent contains seven claims, all of which are being challenged in the Petition. The Challenged Claims are set forth below.

1. An umbrella comprising:

a main pole having a lower end for support by a support surface and extending generally upward to an upper end;

a sliding member associated with the main pole and selectably moveable thereon between lower and upper locations along the main pole;

locking means for releasably securing the sliding member to the main pole at a selected location along the main pole;

an umbrella canopy having a central region;

an arm associated with the central region and extending radially therefrom to an outer end operatively associated with the sliding member;

a brace having a first end pivotably attached to an upper portion of the pole above the sliding member and a second end pivotably attached to the arm;

a winding mechanism having a winder hub around which a line can be wound, the winder hub being mounted to the sliding member and movable therewith;

a line having a first end that winds around the winder hub, an intermediate portion extending from the winder hub along the arm to the umbrella canopy, and a second end that engages the umbrella canopy;

wherein rotation of the winder hub tensions or relaxes the line depending upon the direction of rotation of the winder hub, and

wherein operation of the winding mechanism to apply tension to the line opens and closes the umbrella canopy in response to movement of the line; and

wherein the angle of the umbrella canopy with respect to the main pole can be controlled by moving the sliding member along the main pole.

2. The umbrella of claim 1, wherein the locking means for releasably securing the sliding member to the main pole comprises a

cam latch member having a cam surface, the cam latch member being rotatable with respect to the sliding member between a first position in which the cam surface causes the sliding member to be clamped against the main pole, and a second position in which the cam surface permits movement of the sliding member with respect to the main pole.

3. The umbrella of claim 1, wherein the locking means for releasably securing the sliding member to the main pole comprises a plurality of teeth formed on the main pole and a cooperating pawl associated with the sliding member and selectively operative to engage a selected one of the teeth to prevent movement of the sliding member with respect to the main pole.

4. The umbrella of claim 1, wherein the locking means for releasably securing the sliding member to the main pole comprises a plurality of holes formed in the main pole and a pin associated with the sliding member and operative to engage a selected one of the holes.

5. The umbrella of claim 1, wherein the sliding member has a handle associated therewith.

6. The umbrella of claim 1, wherein the line extends along at least substantially the entire length of the arm.

7. The umbrella of claim 1, further comprising a crank handle operatively associated with the winder hub, whereby rotating the crank handle causes the winder hub to rotate.

B. Prosecution History

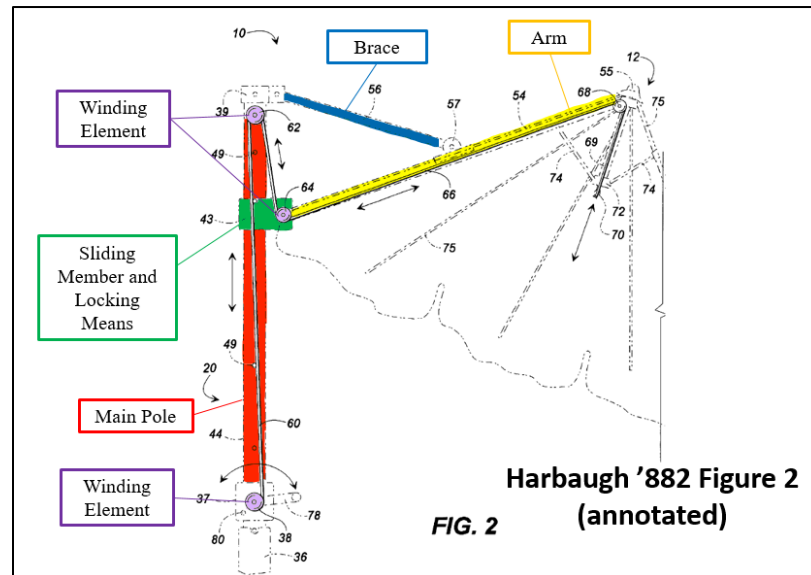
35. I understand that the '492 Patent was filed on May 5, 2009. Ex. 1002 at 169-200 (Patent Application). On June 24, 2010, the examiner issued a first non-final office action, rejecting all claims. *Id.* at 138-143 (June 24, 2010 Non-Final Office Action). I understand that the examiner rejected original independent claim 1 and dependent claims 4 and 6 under pre-AIA 35 U.S.C. § 102(b) as anticipated by Harbaugh '882. *Id.* at 139-140 (June 24, 2010 Non-Final Office Action). I understand that the examiner also rejected claims 2, 3, and 5 under § 103(a) as being unpatentable over Harbaugh '882 in view of Tung '037 and Liu '171. *Id.* at 140-142.

36. Original claim 1, which I understand was rejected over Harbaugh '882, included nearly all of the limitations in issued claim 1. Specifically, the examiner found that Harbaugh '882 teaches a main pole (20); a sliding member (43) associated with the main pole; locking means (48/49) for releasably securing the sliding member; an umbrella canopy (15) having a central region (55); an arm (54); a brace (56) associated with the arm; a winding element (including 38, 64 and 62) mounted to the sliding member and movable therewith; and a line (60); wherein operation of the winding element opens and closes the umbrella canopy; and wherein the angle

of the umbrella canopy can be controlled by moving the sliding member. *Id.* at 139-

140 (June 24, 2010 Non-Final Office Action). I have annotated Figure 2 of Harbaugh

'882 to demonstrate the foregoing.



37. I understand that the examiner explained that the winding element in Harbaugh '882 “is mounted to the sliding member and moveable therewith.” Ex. 1002 at 139-140.

38. I understand that on February 3, 2011, the patentee argued that Harbaugh '882 does not disclose “a sliding member [having] a winding element mounted to the sliding member and movable therewith.” *Id.* at 129. The patentee argued that element 64 cannot be part of the winding element because element 64 is a pulley. *Id.* at 129-130.

39. I understand that the examiner issued a final rejection on April 12, 2011, again rejecting claims 1, 4, and 6 under § 102(b) over Harbaugh '882. *Id.* at 102-111 (April 12, 2011 Final Office Action). The examiner explained that “Harbaugh ['882] clearly teaches a winding element insofar as this element is recited in the claims.” Further, Harbaugh '882 discloses the winding element mounted on the sliding member because “[t]he elements identified as the winding element, which includes 64, clearly mounted on the sliding member and movable therewith, allow for and provide means for winding and providing applying tension to the line. . .” *Id.* at 107 (April 12, 2011 Final Office Action).

40. The examiner also renewed the rejection of claims 2, 3, and 5 under § 103(a). *Id.* at 105-107. I understand that the examiner found that the three “locking means” in the '492 Patent were known in the prior art. The examiner found that Harbaugh '882 teaches the pin and hole “locking means” in claim 4. Specifically, the locking means in Harbaugh '882 “comprises a plurality of holes (49) formed in the main pole and a pin (48) associated with the sliding member and operative to engage a selected one of the holes.” *Id.* at 140 (June 24, 2010 Non-Final Office Action). The examiner rejected Claim 2 because “to modify the locking means and sliding member of Harbaugh ['882] by using a cam locking means with a handle as taught by Tung” would have been obvious. *Id.* at 140-141 (June 24, 2010 Non-Final Office Action). The examiner also rejected claim 3 because “to modify the locking

means of Harbaugh by using a teeth-and-pawl means as taught by Liu” would have been obvious. *Id.* at 141-142 (June 24, 2010 Non-Final Office Action).

41. I understand that on May 16, 2011, the applicant responded to the final office action. Ex. 1002 at 85-100 (RCE and Response to April 12, 2011 Final Office Action). The applicant amended claim 1 to add a limitation that the winding mechanism has “a winder hub around which a line can be wound, the winder hub being mounted to the sliding member and moveable therewith” and that rotation of the winder hub “tensions or relaxes the line. . .” *Id.* at 93-96 (RCE and Response to April 12, 2011 Final Office Action). The applicant never disputed, in response to either office action, the examiner’s findings that the prior art discloses each of the locking means described in the application. *See* Ex. 1002.

42. On August 23, 2011, the examiner entered an examiner’s amendment and allowed the application. *Id.* at 71-75 (Notice of Allowance).

C. The Challenged Claims

43. The ’492 Patent issued with seven claims. Only claim 1 is independent. I have set forth below claim 1 with limitations labeled for reference and the main elements bolded.

Claim 1	
Preamble	An umbrella comprising:

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1[A]	a main pole having a lower end for support by a support surface and extending generally upward to an upper end;
1[B]	a sliding member associated with the main pole and selectably moveable thereon between lower and upper locations along the main pole;
1[C]	locking means for releasably securing the sliding member to the main pole at a selected location along the main pole;
1[D]	an umbrella canopy having a central region;
1[E]	an arm associated with the central region and extending radially therefrom to an outer end operatively associated with the sliding member;
1[F]	a brace having a first end pivotably attached to an upper portion of the pole above the sliding member and a second end pivotably attached to the arm;
1[G]	a winding mechanism having a winder hub around which a line can be wound, the winder hub being mounted to the sliding member and movable therewith;
1[H]	a line having a first end that winds around the winder hub, an intermediate portion extending from the winder hub along the arm to the umbrella canopy, and a second end that engages the umbrella canopy;

1[I]	wherein rotation of the winder hub tensions or relaxes the line depending upon the direction of rotation of the winder hub, and
1[J]	wherein operation of the winding mechanism to apply tension to the line opens and closes the umbrella canopy in response to movement of the line; and
1[K]	wherein the angle of the umbrella canopy with respect to the main pole can be controlled by moving the sliding member along the main pole.

D. Claim Construction

44. I understand that the Patent Trial and Appeal Board (“PTAB”) uses the *Phillips*² standard for claim construction used in civil courts, which is to say that the claims must be given the meaning the terms would have had to a POSITA at the time of the ’492 Patent’s priority date.

1. The claim term “locking means for releasably securing” corresponds with three structures disclosed in the specification of the ’492 Patent

45. I understand that in *ATLeisure v. Treasure Garden, Inc.*, Case No. 1:24-cv-02270 (the “Underlying Litigation”) and in other litigation against other parties,

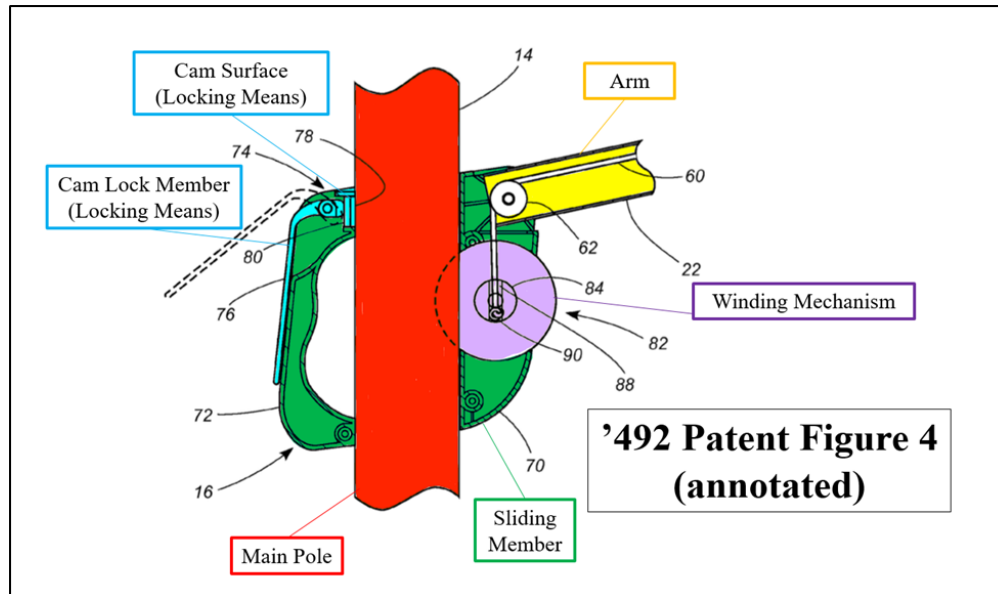
² *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-17 (Fed. Cir. 2015)

ATLeisure has admitted that the “locking means for releasably securing” claim term is a means-plus-function term governed by 35 U.S.C. § 112 ¶ 6, and courts have agreed. *See e.g. ATLeisure, LLC v. Ace Evert, Inc.*, Case No. 1:12-cv-01260, Dkt. 85 (N.D. Ga. May 20, 2013) (showing claim construction order); *ATLeisure, LLC v. Sunvilla Corp.*, Case No. 1:20-cv-04662, Dkt. 46 (N.D. Ga. July 26, 2021) (showing ATLeisure’s claim construction brief); *ATLeisure, LLC v. Lowe’s Home Centers, LLC*, Case No. 6:22-cv-682-WWB-GJK, Dkt. 39 (M.D. Fla. Dec. 16, 2022) (showing ATLeisure’s claim construction brief); *ATLeisure v. Treasure Garden, Inc.*, Case No. 1:24-cv-02270; Ex. 1016.

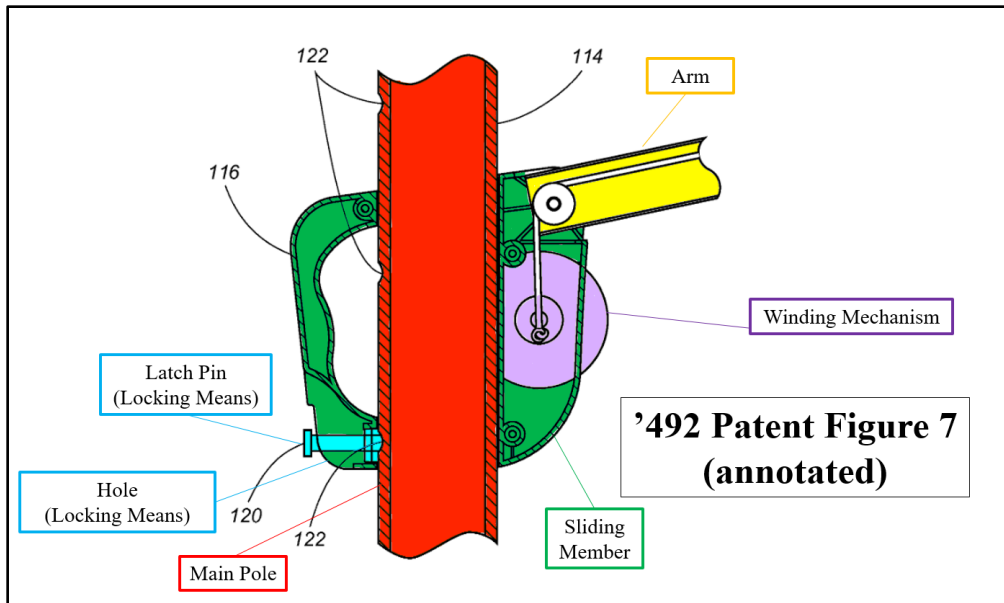
46. I understand that under pre-AIA 35 U.S.C. § 112 ¶ 6, a term in a claim that is “expressed as a means or step for performing a specified function without the recital of structure,” like the “locking means” here, “shall be construed to cover the corresponding structure, material, or acts described in the [patent’s] specification and equivalents thereof.” I understand that when construing the structure of a means-plus-function limitation, the court or Board identifies the structure(s) in the patent specification that performs the claimed function. I understand that in addition to the structures in the specification, the claims are also interpreted as covering equivalents, *i.e.*, undisclosed structures that perform the claimed function in substantially the same way to achieve substantially the same result as the structure in the written description.

47. Here, the “locking means” performs the function of “releasably securing the sliding member to the main pole at a selected location.” Ex. 1001 at Claim 1. As discussed above, the ’492 Patent specification describes three different structures corresponding to the claim term “locking means for releasably securing the sliding member to the main pole at a selected location along the main pole.” *See* Ex. 1001 at Figures 4, 7, 8 and 3:25-40, 4:12-31, and 4:36-40. Specifically, Figures 4, 7, and 8 of the ’492 Patent disclose these three different structures: 1) a cam lock mechanism, 2) a latch pin and hole mechanism, and 3) a ratchet teeth and pawl mechanism. Thus, I understand that as found in prior litigation, § 112 ¶ 6 allows, “ATLeisure’s locking means to cover those three disclosed structures and their equivalents.” *ATLeisure, LLC v. Ace Evert, Inc.*, Case No. 1:12-cv-01260, Dkt. 85 at 14-15 (N.D. Ga. May 20, 2013).

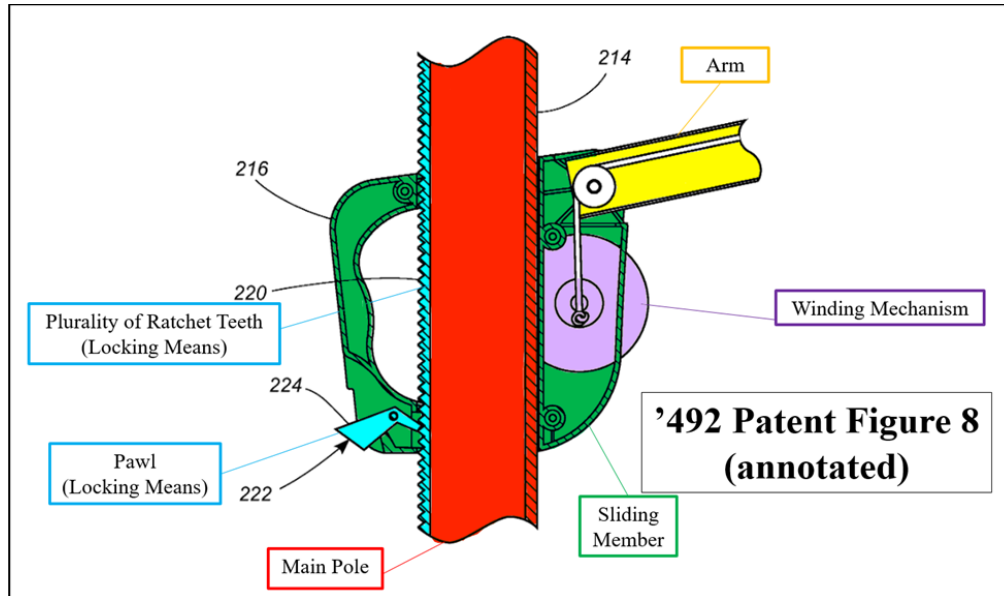
48. The first structure, the cam lock mechanism, is shown in Figure 4 of the ’492 Patent and described in Ex. 1001 at 3:25-40. This structure has a cam lock member with a lever portion that is pivotally mounted in an upper position of a housing of a sliding member and rotates to its extended position to disengage the cam surface to unclamp the sliding member from the main pole. Ex. 1001 at 3:25-40 and Figure 4. When the cam lock member rotates back, the lever portion overlaps the exterior of the grasping portion of sliding member and the cam lock member clamps the sliding member to the main pole.



49. The second structure, the latch pin and hole mechanism, is shown in Figure 7 of the '92 Patent and described in Ex. 1001 at 4:12-20. This structure has a spring-loaded latch pin (120) mounted to the sliding member. The latch pin engages one of a corresponding series of holes in the main pole. Ex. 1001 at 4:12-20, 6:6-10 (claim 4) and Figure 7.



50. The third structure, the ratchet teeth and pawl structure, is shown in Figure 8 of the '492 Patent and described in Ex. 1001 at 4:21-31. This structure has a plurality of ratchet teeth along the rear surface of the main pole. *Id.* at 4:21-31, 5:19-6:5 (claim 3), and Figure 8. A pawl (222) pivotally mounted to the sliding mechanism engages a cooperating one of the ratchet teeth (220) to lock the sliding member in position. *Id.*



2. A POSITA would have understood “mounted to” as meaning “secured to and supported by”

51. Claim 1 recites “the winder hub being **mounted to** the sliding member and movable therewith.” Ex. 1001 at 4:64-65 (emphasis added). A POSITA would understand this term means “secured to and supported by,” consistent with its ordinary meaning. *See* Ex. 1017 at pt 1; Ex. 1018 at 1230; and Ex. 1019 at 1107.

3. A POSITA would have understood “pivotably attached” as meaning “attached so as to rotate around a central point”

52. I understand claim 1 recites “a brace having a first end **pivotably attached** to an upper portion of the pole above the sliding member and a second end **pivotably attached** to the arm.” Ex. 1001 at 4:60-62 (emphasis added). A POSITA would understand this term to mean “attached so as to rotate around a central point,” consistent with its ordinary meaning. *See* 1017 at pt 2; Ex. 1018 at 1431; Ex. 1019 at 1295; Ex. 1020 at 1339.

V. OVERVIEW OF PRIOR ART

A. Chinese Utility Model Patent No. CN 201001460Y (“Wang ’460”) (Ex. 1007)

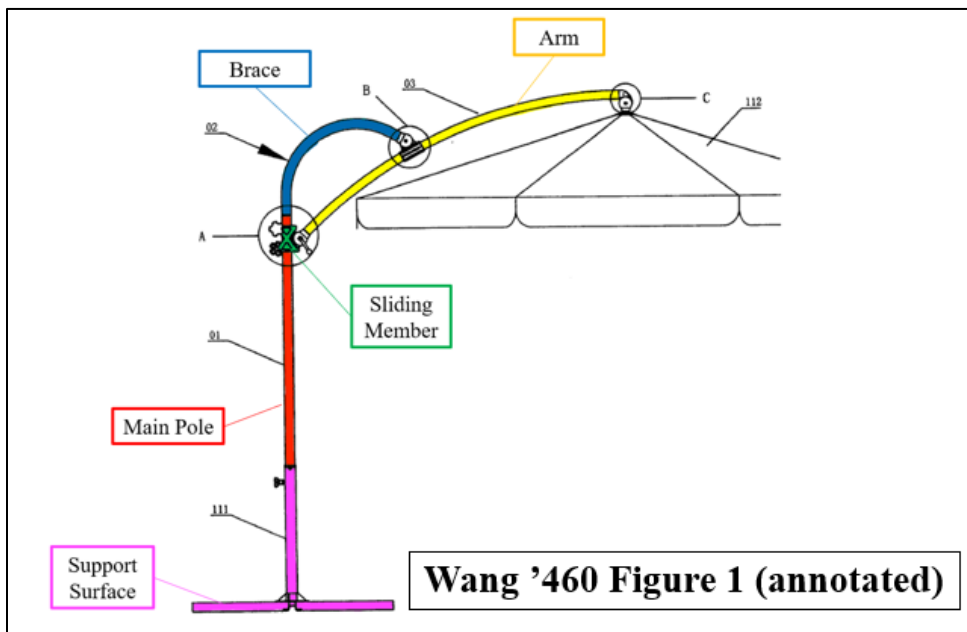
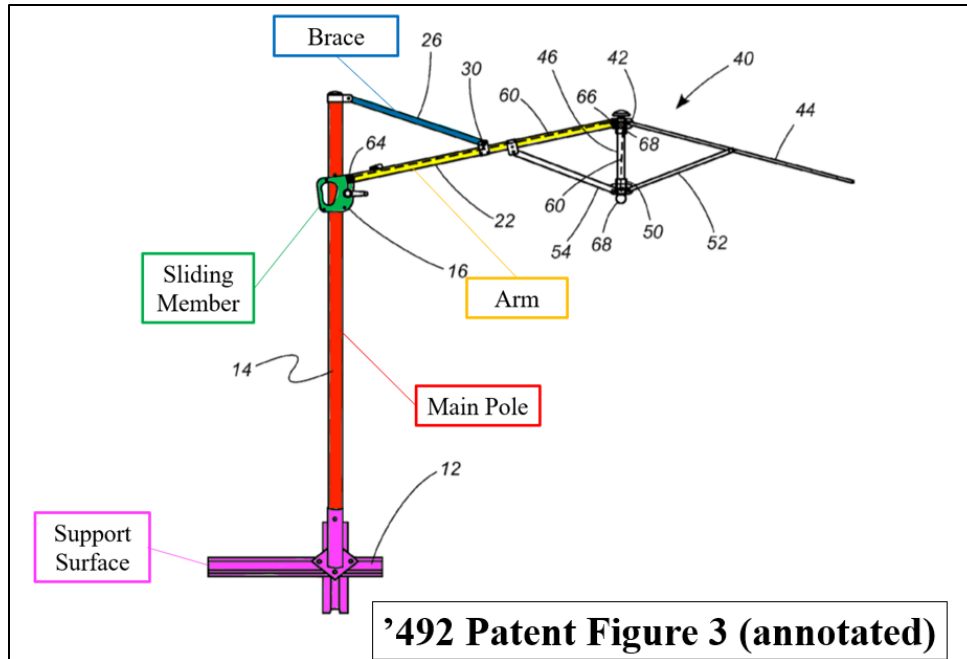
53. Wang ’460 was filed on February 1, 2007 and issued in China on January 9, 2008. *See* Ex. 1007. I am informed Wang ’460 is therefore prior art under pre-AIA 35 U.S.C. § 102(a). Wang ’460 was not cited or considered by the Patent Office during examination of the ’492 Patent but was considered in IPR2021-00430. *See* Ex. 1002.

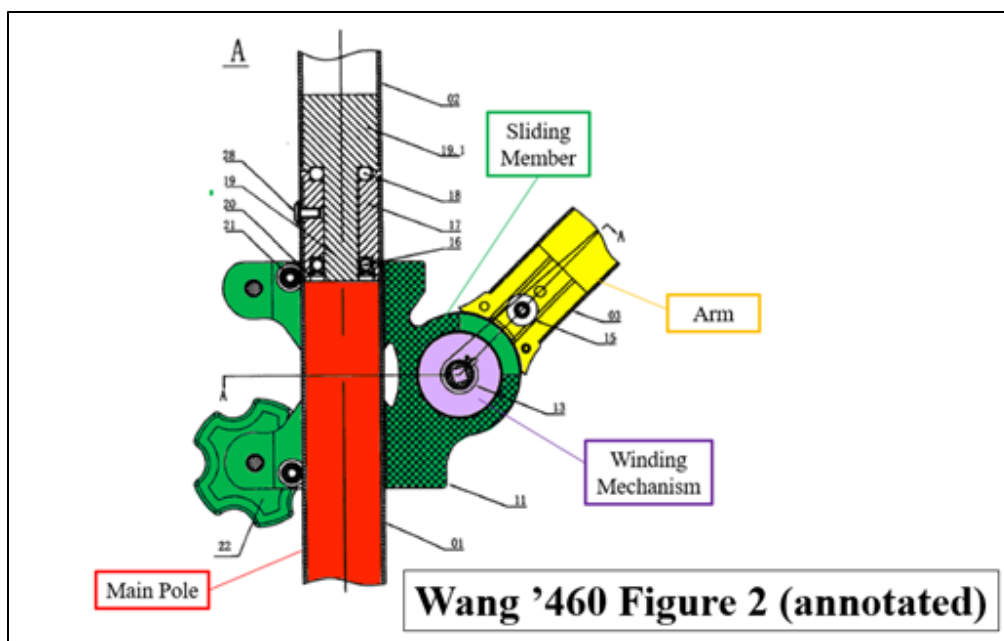
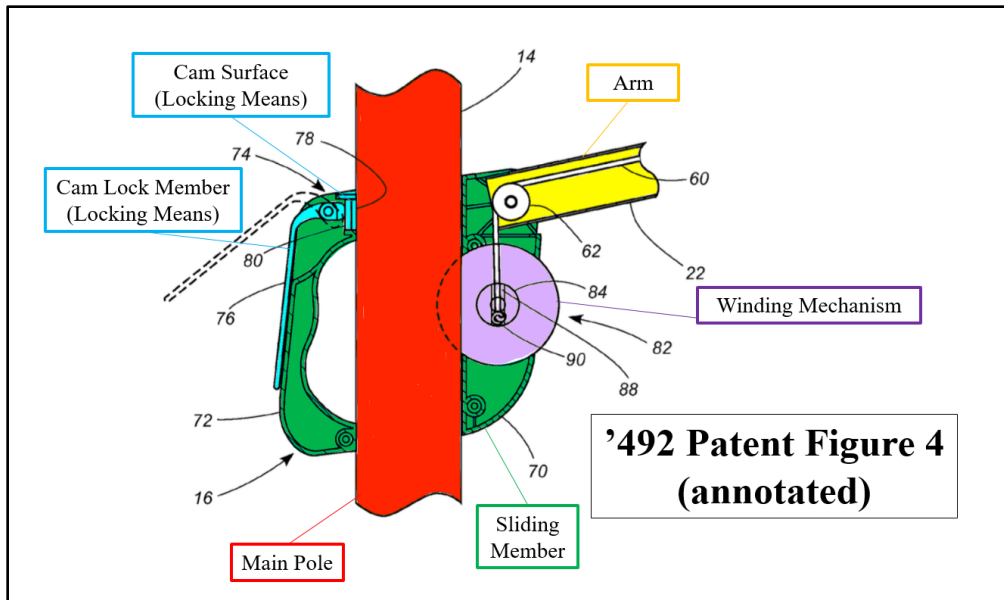
54. Wang ’460 discloses an offset “hanging parasol” or cantilevered umbrella which is in the same field of invention as the “adjustable offset umbrella” disclosed in the ’492 Patent. Ex. 1007 at 10; Ex. 1001 at Title.

55. Wang ’460 teaches a device with at least a main pole (parasol pole 1); a support surface (parasol base 111); sliding member (sliding sleeve 11) with a locking means (bolt-locking hoop structure) and having a winder hub (rope reel 26) around which a line (pull rope 13) is wound; an arm (suspension rod 03); and a brace (pull rod 02) that allows a user to manipulate an umbrella canopy to provide shade. *See* Ex. 1007 at 14-18. The winder hub (rope reel 26) is mounted to casings 141, 142 connected to the sliding sleeve 11 of Wang ’460. *Id.* Figure 1 and 3 of Wang ’460 show embodiments that are similar to Figures 3 and 4 of the ’492 Patent in that both employ securing the sliding member with a compressive force and friction. *Compare*

Ex. 1007 at Figures 1 and 2 *with* Ex. 1001 at Figures 3 and 4 (see annotated below).

Wang '460 discloses a cantilevered umbrella with a sliding member (“sliding sleeve 11”) that “slide[s] smoothly with the parasol pole” to adjust the canopy angle. Ex. 1007 at 17. The Wang '460 umbrella also has a winder hub (rope wheel 26) and crank mounted to the sliding sleeve 11. *Id.* at 12 (Claim 1) and 17. *Id.* at Figure 1 and 2 (annotated below).





56. A pull rope (13) is fixed to a reel (26) of the rope winder and allows a user to open and close the canopy by winding the line around the winder hub. *Id.*

at 12 (Claim 1). Wang '460 discloses a locking means on “parasol pole 01...with a hoop-type sliding sleeve 11 locked by a bolt.” *Id.* at 17.

57. While Wang '460 does not disclose the identical structure corresponding to the “locking means” in the '492 Patent, those structures were well-known and disclosed in prior art. *See, e.g.*, Exs. 1010 at 3:36-46, 1011 at 1:19-31, 2:21-38, 3:10-30, 1013 at 28.

58. Because Wang '460 has a locking device (i.e., bolt-locking hoop structure) to affix the sliding member at a specific position along the main pole, it would have been obvious to a POSITA to make a simple substitution of one known element for another replacing the structure used along the main pole with one of the structures corresponding to “locking means” in the '492 Patent. Ex. 1007 at 17.

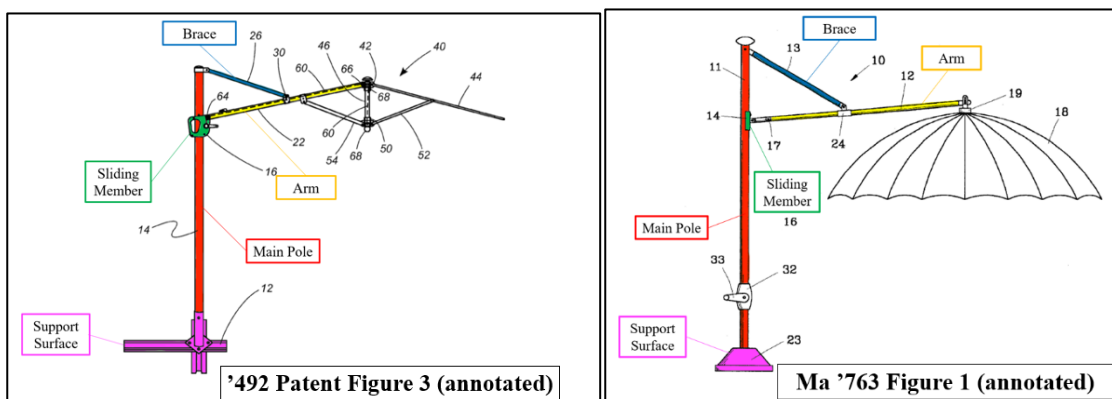
59. Wang '460 also states that other umbrella designs are “complicated, and the opening and closing of the parasol cover is quite inconvenient” and “unstable when the parasol cover is opened...” Ex. 1007 at 14.

B. U.S. Patent No. 6,321,763 (“Ma ’763”) (Ex. 1009)

60. Ma '763 issued in the United States on November 27, 2001, filed on June 8, 2000, and claims a priority date of May 3, 2000. *See* Ex. 1009. I am informed that Ma '763 is therefore prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b), and 102(e). Ma '763 was not cited or considered by the Patent Office during examination of the '492 Patent. Ma '763 discloses a offset umbrella (“umbrella structure”) which

is in the same field of invention as the “adjustable offset umbrella” disclosed in the ’492 Patent. Ex. 1009 at Title; Ex. 1001 at Title.

61. Ma ’763 teaches a device with at least a main pole (support pole 11); a support surface (base 23); a sliding member (slide 14); a line (secondary rope 26); an arm (arm 12); and a brace (link 13) that allows a user to manipulate an umbrella canopy to provide shade. *See* Ex. 1009 at 2:49-5:35 (Description). Figure 1 of Ma ’763 shows an embodiment that is similar to Figure 3 of the ’492 Patent. *Cf* Ex. 1009 at Figure 1 *with* Ex. 1001 at Figure 3 (see annotated below). As shown below in annotated Figure 1 and described above, Ma ’763 discloses a offset umbrella with an arm and a brace, as well as a sliding member that adjusts the angle of the arm and the canopy. *See* Ex. 1009 at Figure 1.



62. Like the umbrella claimed in the ’492 Patent, the Ma ’763 umbrella utilizes tensioning and releasing the line to open and close the umbrella canopy. Ex. 1009 at 4:41-52 and Figures 3 and 4. Ma ’763 discloses that when the slide is driven up towards the upper end of the pole, “the distance between the slide 14 and the pin

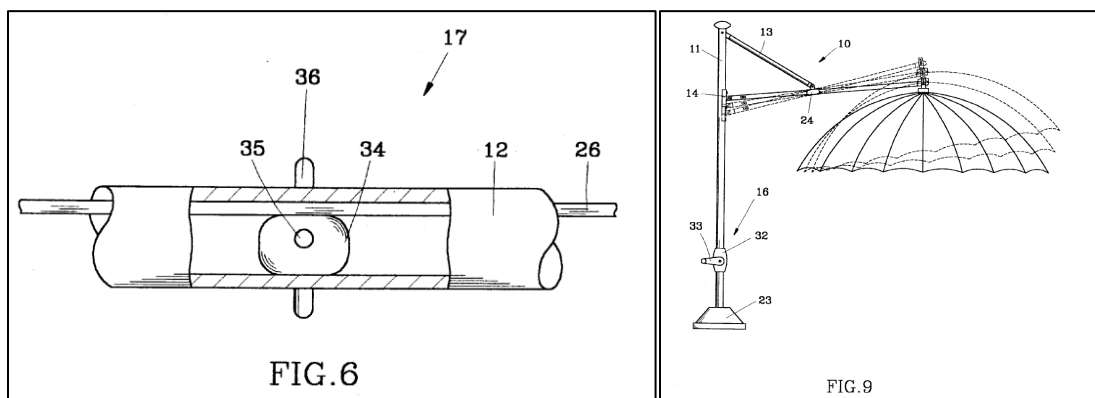
29 ... is increased which causes the runner 21 to move toward the crown 19 and thus open the panel 18.” Ex. 1009 at 3:58-67 and 4:41-47. Thus, tension is applied to the secondary rope 26 due to the secondary rope’s fixed length. Instead of using a winding mechanism to apply tension to the secondary rope 26, the user then uses locking device 17 to pinch the secondary rope 26 and to maintain tension. *Id.* at 4:22-25 and Figure 6. Ma ’763 also teaches that locking device 17 may be located on the sliding member (slide 14). *Id.* at 4:36-40. A user then manipulates slide 14 using the crank driving device 16 to perform any subsequent adjustment to the height of the deployed umbrella. *Id.* at 4:15-21 and Figure 9.

63. Like the umbrella claimed in the ’492 Patent, the Ma ’763 umbrella has a line running from a securing device mounted to the sliding member and along the arm to the canopy where tensioning and releasing the line opens and closes the canopy. Ex. 1009 at 3:50-57 and Figures 2 and 3.

64. Ma ’763 discloses that one end of the line (secondary rope 26) is attached to the main pole toward the base and runs over a pulley mounted on the end of the arm that connects to the slider and continues along the arm and through the top of the canopy where it is secured. Ex. 1009 at 3:17-19 and Figure 3.

65. Ma ’763 explains that “[t]he locking device 17 may be manually actuated to engage and thus fix the secondary rope 26. The locking device 17 comprises a locking member 34 pivotally mounted in the arm 12 by an eccentric

pin 35. The secondary rope 26 extends through a gap between the locking member 34 and an inner surface of the arm 12. The pin 35 is coupled to a manual knob 36. When the knob 36 is rotated by a user, the locking member 34 is moved in such a way so as to reduce the gap, and thereby pinch the secondary rope 26 between the locking member 34 and the inner surface of the arm 12, and thus effectively lock the secondary rope 26 in the particular position.” Ex. 1009 at 4:24-35 and Figure 3.



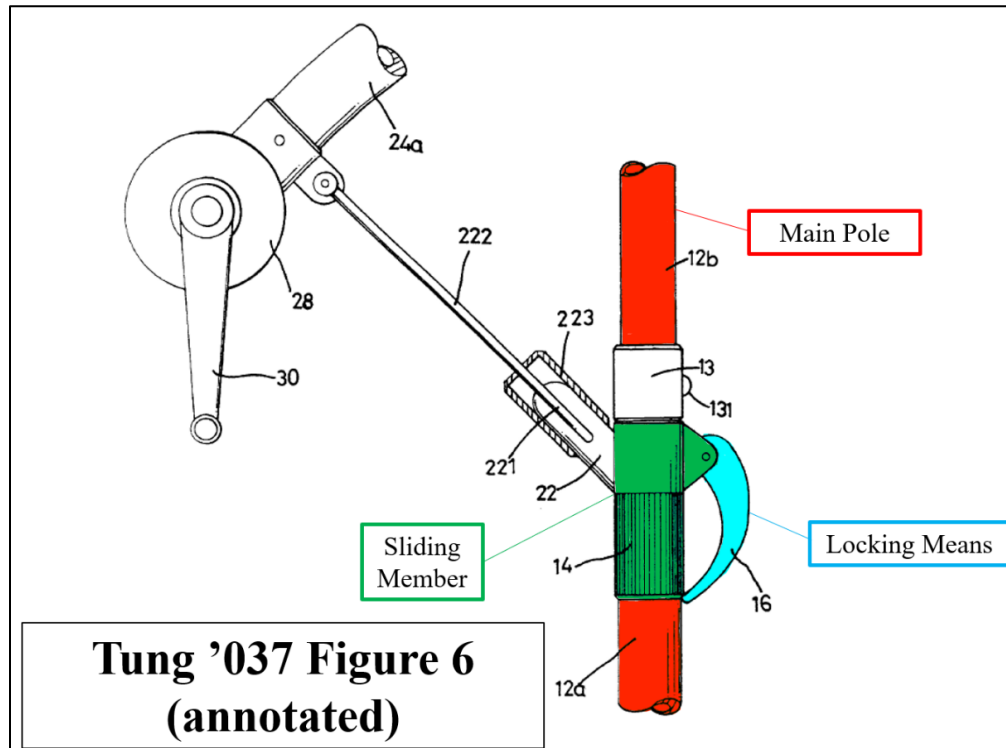
66. Ma '763 suggests that slide 14 is locked into place based on the tension of the primary rope 25 and the presence of double gears 45, 46 constraining both upward and downward movement of the slide. Ex. 1009 at 3:12-16, 3:57-67 and 5:22-35 and Figure 8.

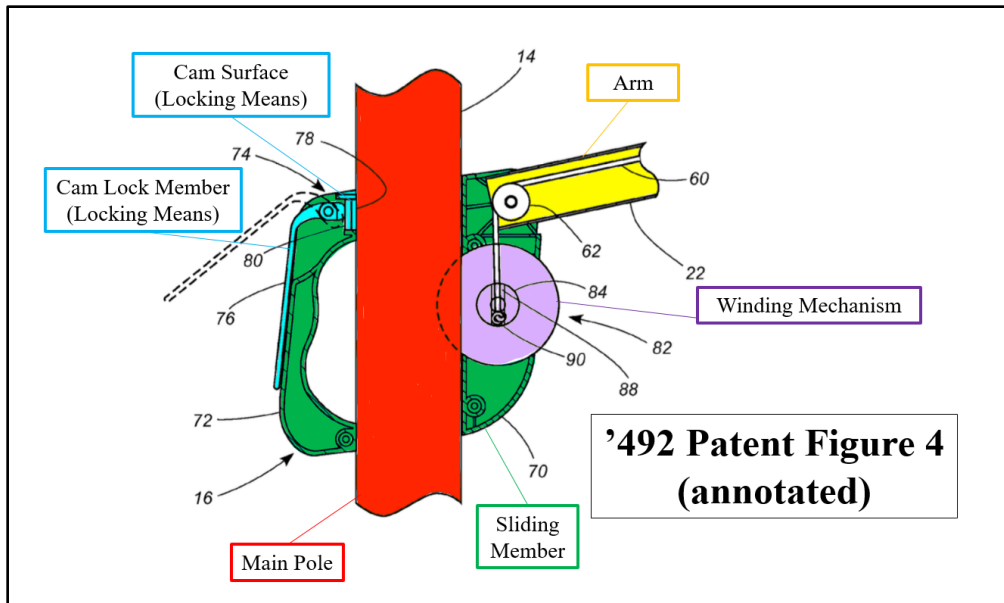
67. Although the Ma '763 umbrella has a different device for locking the slide and opening and closing the umbrella canopy, the use of a locking means and winding mechanism similar to what is claimed in the '492 Patent were known in the prior art (e.g., Tung '037 and Wang '460). Replacing the locking and winding

devices in Ma '763 is a simple substitution of known elements and would have been obvious to a POSITA.

C. U.S. Patent No. 6,478,037 (“Tung ’037”) (Ex. 1010)

68. Tung ’037 issued in the United States on November 12, 2002. *See* Ex. 1010. I am informed that Tung ’037 is therefore prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b), and 102(e). Tung ’037 teaches a “foldable sunshade with a tiltable canopy” that uses a similar cam latch member locking means as disclosed in the ’492 Patent. *See id.* at Title, 3:36-46, 4:56-63. *Cf.* Ex. 1010 at Figure 4 with Ex. 1001 at Figure 4 (see annotated below).



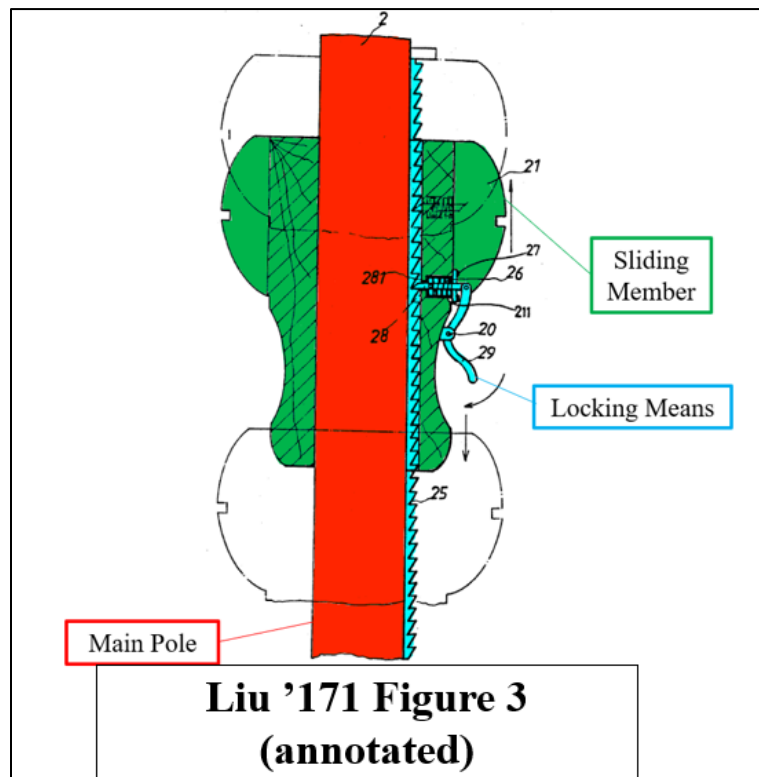


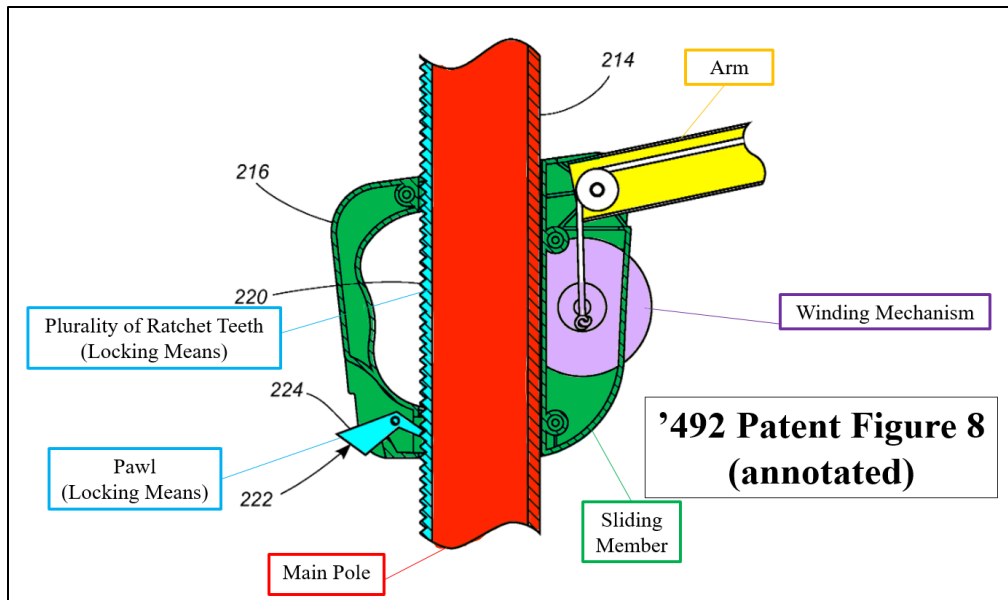
69. Tung '037 is in the same field of invention as the “adjustable offset umbrella” disclosed in the '492 Patent. During the prosecution of the '492 Patent, the examiner identified Tung '037 as prior art that taught the cam latch member as recited in a dependent claim 2. *See* Ex. 1002 at 140-141 (June 24, 2010 Non-Final Rejection), 105-106 (April 12, 2011 Final Rejection). I understand that the applicant never disputed, in response to either office action, the examiner’s findings that the prior art disclosed a cam latch locking mechanism as described in the application. *See id.* at 125-133 (Response to June 24, 2010 Office Action) and 92-100 (Response to April 12, 2011 Final Rejection). Thus, Tung '037 is indeed prior art to the '492 Patent.

D. U.S. Patent No. 5,284,171 (“Liu ’171”) (Ex. 1011)

70. Liu ’171 issued in the United States on February 8, 1994. *See* Ex. 1011.

I am informed that Liu ’171 is therefore prior art under pre-AIA 35 U.S.C. §§ 102(a), 102(b), and 102(e). Liu ’171 teaches a “sunshade opening and supporting device” that uses a similar teeth and pawl locking means as disclosed in the ’492 Patent. *See id* at Title, 2:61-4:8 *Compare* Ex. 1011 at Figure 3 *with* Ex. 1001 at Figure 8 (see annotated below).





71. Liu '171 is in the same field of invention as the “adjustable offset umbrella” disclosed in the '492 Patent. During the prosecution of the '492 Patent, the examiner identified Liu '171 as prior art that taught the teeth and pawl locking means. *See* Ex. 1002 at 141-142 (June 24, 2010 Non-Final Rejection), 106-107 (April 12, 2011 Final Rejection). I understand that the applicant never disputed, in response to either office action, the examiner’s findings that the prior art disclosed a locking means as described in the application. *See id.* at 125-133 (Response to June 24, 2010 Office Action) and 92-100 (Response to April 12, 2011 Final Rejection). Thus, Liu '171 is prior art to the '492 Patent.

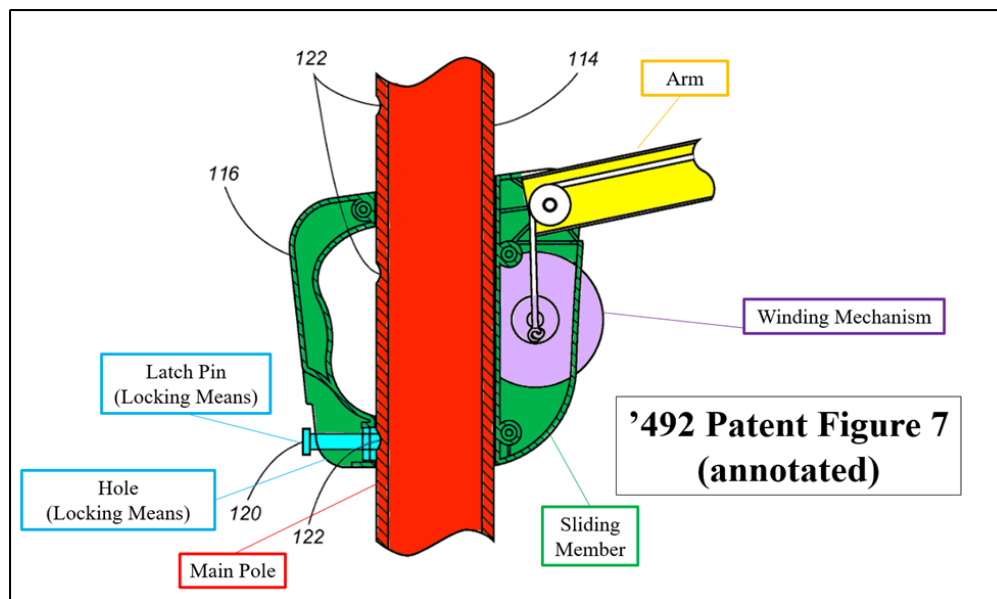
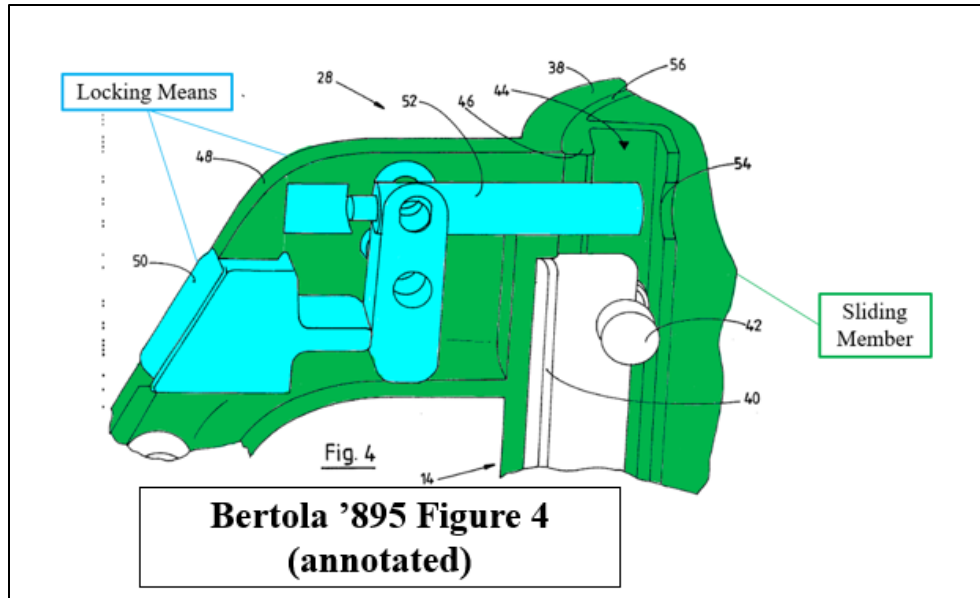
E. German Patent Application Publication No. DE20014895U1 (“Bertola '895”) (Ex. 1013)

72. Bertola '895 was registered on November 16, 2000. *See* Ex. 1013. I am informed that Bertola '895 is therefore prior art under pre-AIA 35 U.S.C. §§ 102(a)

and 102(b). Bertola '895 is in the same field of invention as the “adjustable offset umbrella” disclosed in the '492 Patent. Bertola '895 was not cited or considered by the Patent Office during examination of the '492 Patent but was considered in IPR2021-00430. Bertola '895 discloses an adjustable offset umbrella device that uses a spring-loaded pin and hole locking means as disclosed in the '492 Patent. *See id* at 30 (reciting a “spring pretension” loaded pin 52 and hole 54 for “fixation of the slider 28 on the mast 14...”). *Cf.* Ex. 1013 at Figure 4 *with* Ex. 1001 at Figure 7 (see annotated below).

73. As shown below, “a button 50 is arranged in the handle 48 and is used to operate a latch 52 of the outer tube 56, which latch engages in a hole 54 of the outer tube 56 for fixation of the slider 28 on the mast 14.” Ex.1013 at 30.

74. Bertola further explains that it is “advantageous to pretension the latch 52 using a pretensioning means such that the latch autonomously transitions into the locked or supported position. By means of the button 50, the latch 52 can then transition into the unlocked position against the spring pretension, whereupon the slider 28 can then be adjusted upward, thus ensuring seamless and straightforward sliding of the slider 28 on the mast 14.” Ex. 1013 at 30.

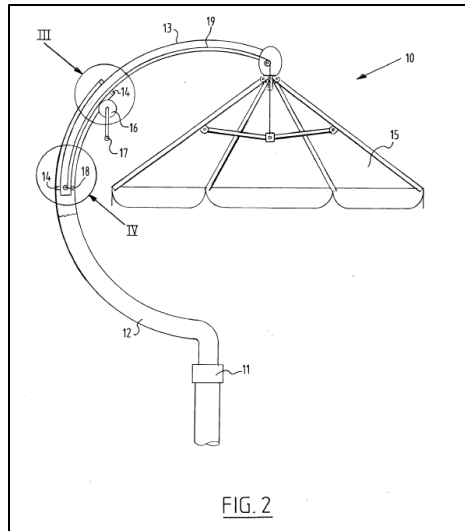


Bertola '895 describes a need to create an umbrella device that is not “difficult” or “impractical to handle” that allows easy and “fixable” height adjustment. *Id.* at 25 (Description).

F. European Patent Application No. EP1602297 (Ma '297) (Ex. 1015)

75. Ma '297 was filed as a European Patent Application on April 6, 2004 and published on July 12, 2005. *See* Ex. 1015. I am informed that Ma '297 is therefore prior art under pre-AIA 35 U.S.C. §§ 102(a) and 102(b). Ma '297 was not cited or considered by the Patent Office during examination of the '492 Patent. Ma '297 teaches an umbrella device with a fixed main pole (first tubular element 12), an arm (second tubular element 13) coupled with the fixed pole, and “[i]nside the second tubular element 13[,] a reel 18 is present along which a cord 19 is wound, which is guided through the second tubular element 13 and is used to open and close the parasol 15.” Ex. 1015 at [0018], [0022], and Figure 2 and 4. Ma '297 is in the same field of invention as the “adjustable offset umbrella” disclosed in the '492 Patent. An exemplary image of Figure 2 is shown below.

76. Ma '297 states that eliminating pulleys provides a more robust design. Particularly, in connection with identifying problems in the prior art, Ma '297 states that a “mechanism using a cord for moving [a] second tubular element relative to [a] first tubular element is rather susceptible for defects for example caused by breakage of the cord or jamming of the cord at one of the several pivot areas around which the cord is guided.” Ex. 1015 at [0004]



VI. CLAIMS 1-7 OF THE '492 PATENT ARE UNPATENTABLE

A. Ground 1: Claims 1-7 of the '492 Patent are Obvious over Wang '460 in view of Tung '037 and in further view of Liu '171 or Bertola '895

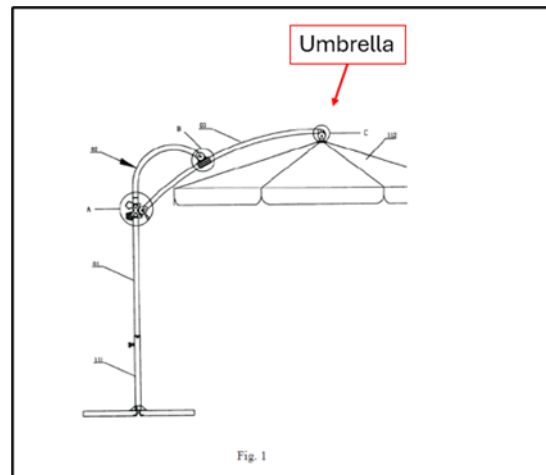
77. Based on my review, Wang '460 in view of Tung '037 render claims 1 and 5-7 as obvious under pre-AIA 35 U.S.C. § 103. Wang '460 in view of Liu '171 renders claim 2 as obvious under pre-AIA 35 U.S.C. § 103. Wang '460 in view of Bertola '895 renders claim 3 as obvious under pre-AIA 35 U.S.C. § 103.

1. Claim 1

78. Wang '460 in view of Tung '037 renders claim 1 as obvious under pre-AIA 35 U.S.C. § 103.

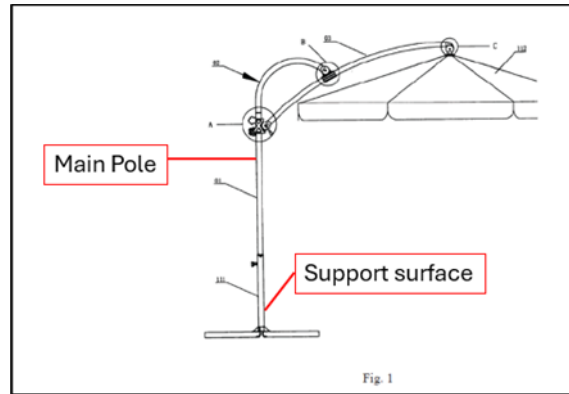
a. Preamble: “An umbrella comprising”

79. Wang '460 generally discloses a “parasol” device. *See* Ex. 1007 at 10-11 (Title and Abstract), 12-13 (Claims), 14-18 (Description and Summary), Figure 1.



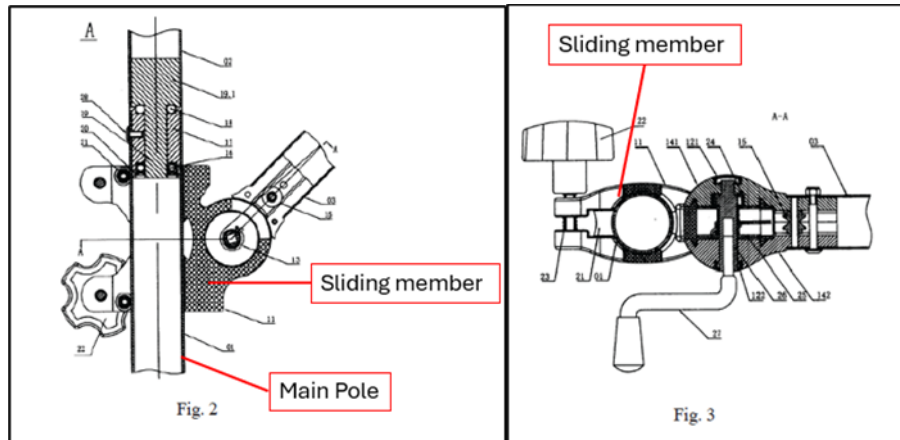
b. Claim 1.a: “a main pole having a lower end for support by a support surface and extending generally upward to an upper end”

80. Wang '460 discloses a main pole (parasol pole 1) having a lower end for support by a support surface (parasol base 111) and extending generally upward to an upper end. As shown in the annotated Figure 1 below. Wang '460 discloses a main pole (parasol pole 1) and a support surface (parasol base 111). Ex. 1007 at 19 (Figure 1). *See id.* at 12 (claim 1) and 14-16.



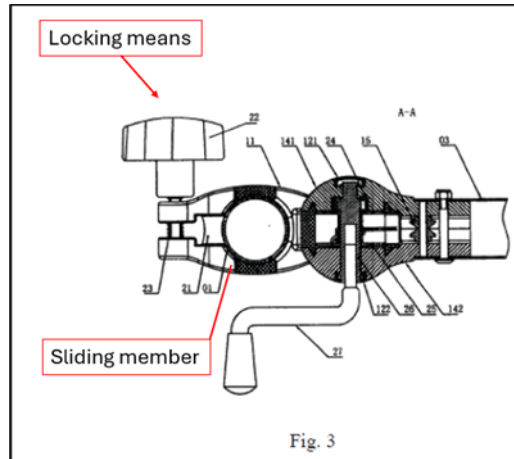
c. Claim 1.b: “a sliding member associated with the main pole and selectably moveable thereon between lower and upper locations along the main pole”

81. Wang '460 discloses a sliding member (sliding sleeve 11) associated with the main pole (parasol pole 1) and selectably moveable thereon between lower and upper locations along the main pole (parasol pole 1). As shown in Figures 1-3 (annotated below), Wang '460 explains that a “parasol pole (01) set has a sliding sleeve (11) of a locking device that matches the parasol pole” and that “the sliding sleeve (11) has a bolt-locking hoop structure.” Ex. 1007 at 12 (claims 1 and 3). Wang '460 further discloses that “[a] roller 21 is respectively installed at the upper end and lower end of the sliding sleeve 11 to slide smoothly with the parasol pole” and “[w]hen opening the parasol, the sliding sleeve of the parasol pole is pushed up.” *Id.* at 15, 17, and 19-20 (Figures 1-3).



d. Claim 1.c: “locking means for releasably securing the sliding member to the main pole at a selected location along the main pole”

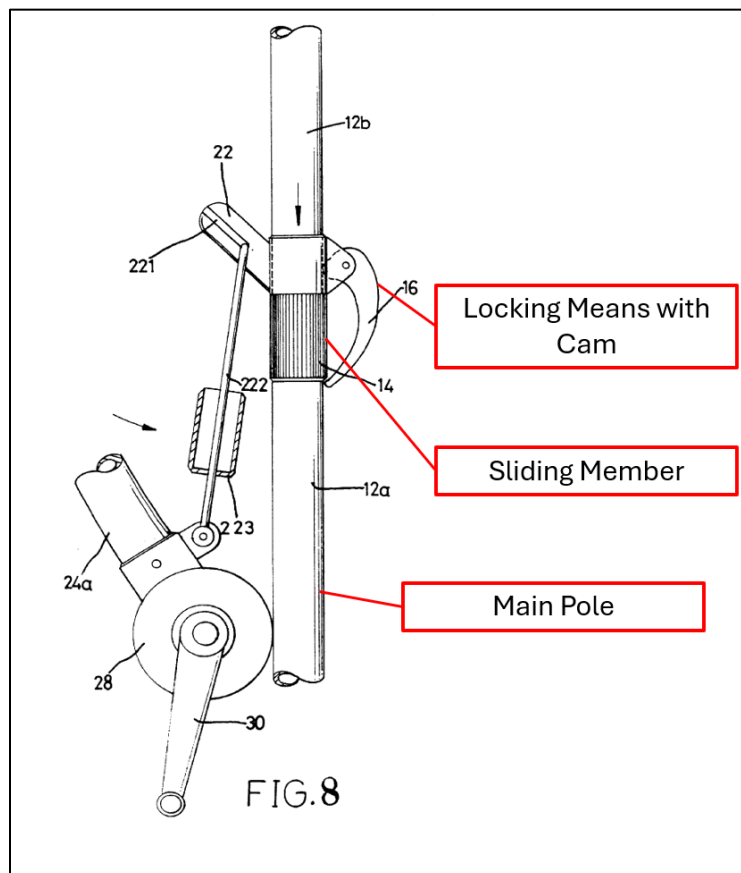
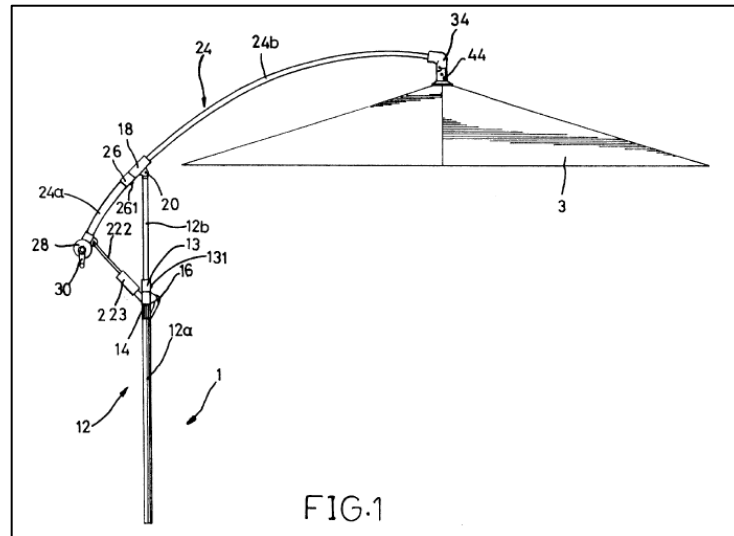
82. Wang ’460 discloses a locking means (bolt-locking hoop structure) for releasably securing the sliding member (sliding sleeve 11) to the main pole (parasol pole 1) at a selected location along the main pole (parasol pole 1). As shown in Figure 3 (annotated below), Wang ’460 explains that “parasol pole 01 is equipped with a hoop-type sliding sleeve 11 locked by a bolt” and “[o]ne end of the bolt is equipped with a rotating handle 22, and a spring 23 is sleeved on the bolt portion between the hoop chucks.” Ex. 1007 at 17 and 20 (Figure 3).



83. To the extent this limitation is not disclosed in Wang '460, Tung '037 discloses a cam latch locking means. Tung '037 discloses a locking means for releasably securing the sliding member (adjusting sleeve 14) to the main pole (supporting rod 12) comprising a cam latch member (lever 16) having a cam surface, the cam latch member (lever 16) being rotatable with respect to the sliding member (adjusting sleeve 14) between a first position in which the cam surface causes the sliding member (adjusting sleeve 14) to be clamped against the main pole (supporting rod 12), and a second position in which the cam surface permits movement of the sliding member (adjusting sleeve 14) with respect to the main pole (supporting rod 12). For example, Tung '037 states “[t]he main frame 1 includes a supporting rod 12, an adjusting sleeve 14 slidably mounted around the supporting rod 12, and a lever 16 mounted to the adjusting sleeve 14. When the lever 16 is in a locked position, the adjusting sleeve 14 is frictionally retained in place, and when the lever 16 is in a released position, sliding movement of the adjusting sleeve 14

relative to the supporting rod 12 is allowed.” Ex. 1010 at 3:36-46. *See id.* at 4:57-63

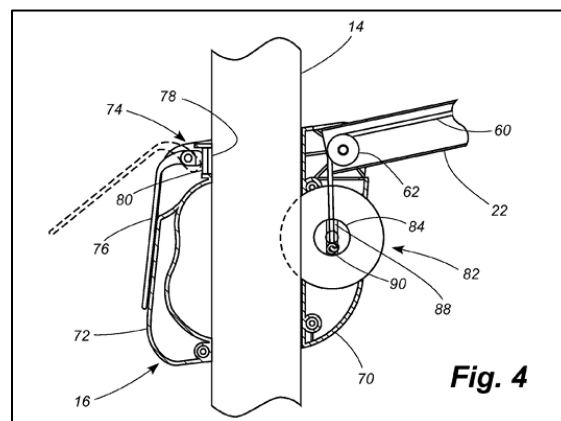
and Figures 1,5, and 6-10. Figure 1 and an annotated Figure 8 are reproduced below.



84. Similarly, the '492 Patent also discloses a similar cam latch locking means. The '492 Patent states:

A cam lock member 74 is pivotally mounted in an upper portion of the housing 70. The cam lock member 74 comprises a lever portion 76 and a cam surface 78. When viewed from the end, the lever portion 76 is slightly narrower than the housing 70. When the cam lock member 74 is in its “down” or “stored” position, the cam surface 78 bears against a spring loaded button 80, which in turn clamps against the main pole 14 to secure the sliding member 16 against the pole. When the lever portion 76 of the cam lock member 74 is in its up position, shown in the dashed line, the cam surface 78 is rotated free of the button 80. The spring then causes the button 80 to retract, and the sliding member 16 can move freely up and down the main pole 14.

Ex. 1001 at 3:27-40. An image of the '492 Patent's cam latch locking mechanism shown in Figure 4 is shown below.



i. Motivation to combine Wang '460 with Tung '037

85. A POSITA would have understood that a simple substitution of the locking mechanism in Wang '460 with the cam latch locking mechanism of Tung '037 would yield predictable results to improve adjusting collapsible umbrella products and to secure the umbrella into place. Indeed, Wang '460 and Tung '037 both relate to adjustable, tiltable umbrella products and are thus in the same industry.

Moreover, the examiner for the '640 Non-Provisional Application also cited Tung '037 as prior art and the applicant did not deny it. Ex. 1002 at 93-96 and 106.

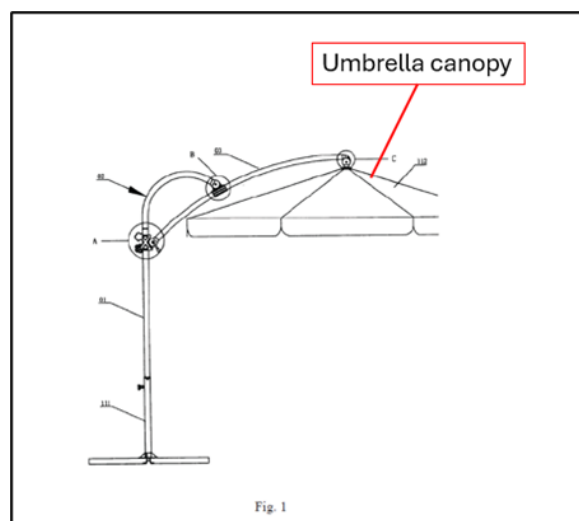
86. Wang '460 explains the benefit that “the parasol cover can rotate 360° around the parasol pole, and the pitch angle thereof can also be adjusted.” Tung '037 similarly states that a primary object of the invention is “to provide an improved sunshade in which the canopy is tiltable, and adjustment of the tilting angle of the canopy can be easily achieved.” Ex. 1010 at 1:34-37. Further, Tung '037 identifies the benefits of its sliding member and locking mechanism in stating that a further object of the invention is providing an “improved Sunshade in which the canopy can be reliably retained in a desired tilting angle.” *Id.* at 1:37-41. Thus, using the teaching of Tung '037 to substitute the cam lever of Tung '037 for the screw locking mechanism of Wang '460 would yield a predictable result and would have been obvious to a POSITA .

87. Tung '037 also describes that other umbrella adjustment “is troublesome...[and] the user has to lower the canopy to a reachable level.” Ex. 1010 at 1:16-18. Also, Tung '037 states its design allows for easy adjustment of the canopy. *Id.* at 1:34-37. Wang '460 also explains that other umbrella designs are “complicated, and the opening and closing of the parasol cover is quite inconvenient” and “unstable when the parasol cover is opened.” Ex. 1007 at 14. Thus, a POSITA would have been motivated to combine the cam latch mechanism

taught in Tung '037 with the locking means in Wang '460 to make a device that is easier and safer to use. A POSITA would understand also that using the cam latch mechanism in Tung '037 provides for a more stable locking means than the locking means taught in Wang '460. Thus, a POSITA would understand to use the locking mechanism of Tung '037 to achieve the goals of both references.

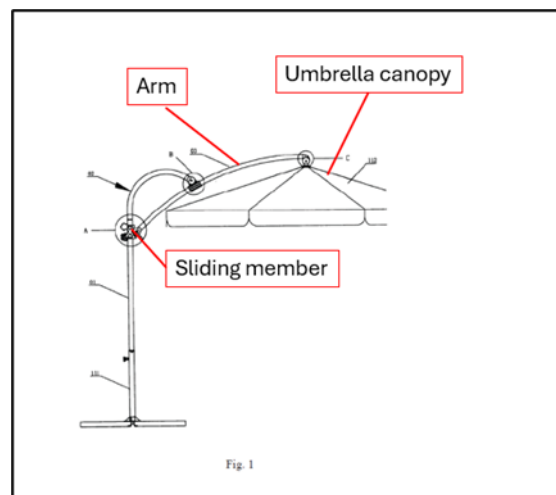
e. Claim 1.d: “an umbrella canopy having a central region”

88. Wang '460 discloses an umbrella canopy (a parasol cover 112) having a central region. As shown in Figure 1 (annotated below), the hanging parasol with a central region “is mainly composed of a parasol pole 01, a tubular suspension rod 03 composed of a curved arc tube, a tubular pull rod 02, a parasol cover 112 and a parasol frame.” Ex. 1007 at 16 and 19 (Figure 1). The umbrella canopy (parasol cover) central region is around the attachment to the tubular suspension rod 03 at “C.” Ex. 1007 at 16 and 19 (Figure 1).



- f. Claim 1.e: “an arm associated with the central region and extending radially therefrom to an outer end operatively associated with the sliding member”**

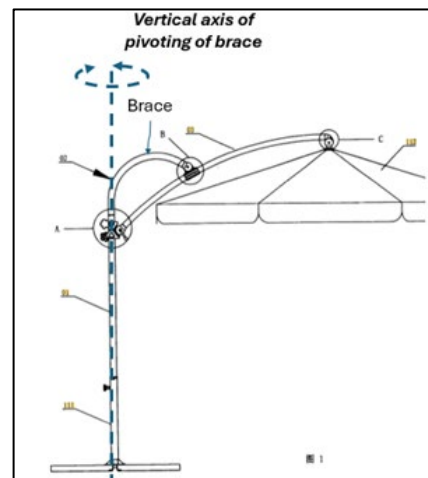
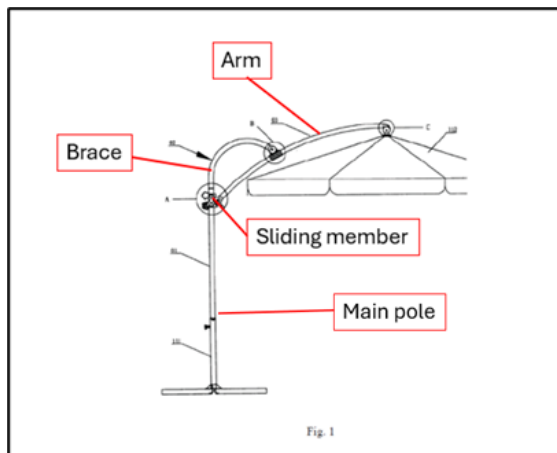
89. Wang '460 discloses an arm (suspension rod 3) associated with the central region (where the umbrella canopy connected to the arm) and extending radially therefrom to an outer end operatively associated with the sliding member (sliding sleeve 11). As shown in Figure 1 (annotated below), “the sliding sleeve comprises a rope winder and is shaft-connected to a bottom end of the suspension rod (03), a top end of the suspension rod (03) and an upper parasol disc (70) of the parasol frame have a pitch rotating connection structure.” Ex. 1007 at 12 (claim 1) and 19 (Figure 1). *See id.* at 10-11 (Abstract), 14, and 16.

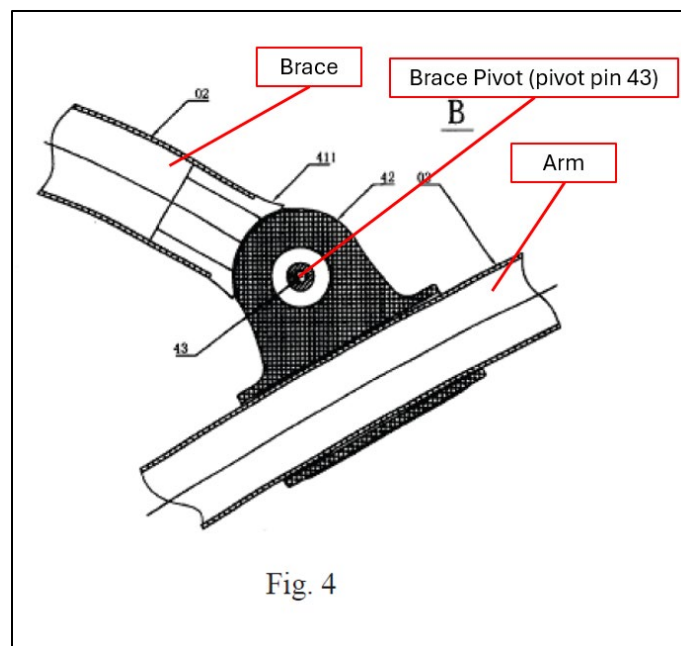
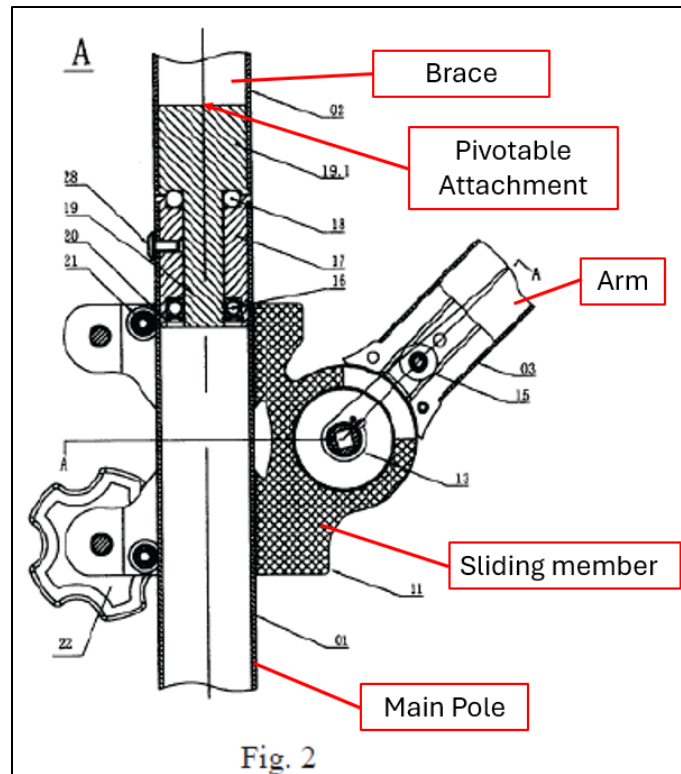


- g. Claim 1.f: “a brace having a first end pivotably attached to an upper portion of the pole above the sliding member and a second end pivotably attached to the arm”**

90. Wang '460 discloses a brace (pull rod 02) having a first end pivotably attached to an upper portion of the pole (parasol pole 1) above the sliding member

(sliding sleeve 11) and a second end pivotably attached to the arm (suspension rod 03). As shown in Figures 1, 2, and 4 (annotated below), Wang '460 explains that the brace is pivotably attached to the upper end of the pole as follows: “[a] bottom end of the pull rod is connected to a top end of the parasol pole; a top end of the pull rod is connected to the suspension rod in a sleeving manner, the top end of the parasol pole and the bottom end of the pull rod have a horizontal rotating connection structure.” Ex. 1007 at 10-11 (Abstract) and 19-21 (Figures 1, 2, and 4). *See id.* at 12-13 (claim 1, 4, 6), 14-16. A POSITA would understand that “horizontal rotating connection structure” between the pull rod and the parasol pole is a form of pivoting of the pull rod relative to the parasol pole. The pivoting occurs in a horizontal plane about a vertical axis through the pole.





91. Wang '460 explains in Claim 4 that “an upper end and a lower end of the bushing respectively form a bearing seat, a shaft cap (19.1) of a bolt-shaped rotating shaft (19) is fastened to a lower end of the tubular pull rod (02) and seated on an upper bearing (18), a lower end of the rotating shaft (19) extends into the bushing (17) and is fastened to a lower bearing (16) to form the horizontal rotating connection structure.”

92. Wang '460 further discloses that “[t]he hanging parasol is mainly composed of a parasol pole 01, a tubular suspension rod 03 composed of a curved arc tube, a tubular pull rod 02... [t]he rotating shaft 19 extends into the bushing 17 and is tightened with an inner ring of the lower bearing 16 so that the pull rod 02 can rotate 360° horizontally relative to the parasol pole 01... With reference to Figure 4, the top end of the pull rod 02 is equipped with a concave arc joint 411 to slide relatively with a semi-cylindrical lug of a tube sleeve 42 of the suspension rod 03. The joint 411 and the tube sleeve 42 are hingedly connected by a pivot pin 43, so that when the suspension rod 03 slides in the tube sleeve 42, the semi-cylindrical lug can rotate relative to the concave arc joint 411.” *Id.* at 16-17. Thus, the brace (pull rod) has a first end pivotably attached to an upper portion of the pole (parasol pole) above the sliding member (sliding sleeve) and a second end pivotably attached to the arm (suspension rod).

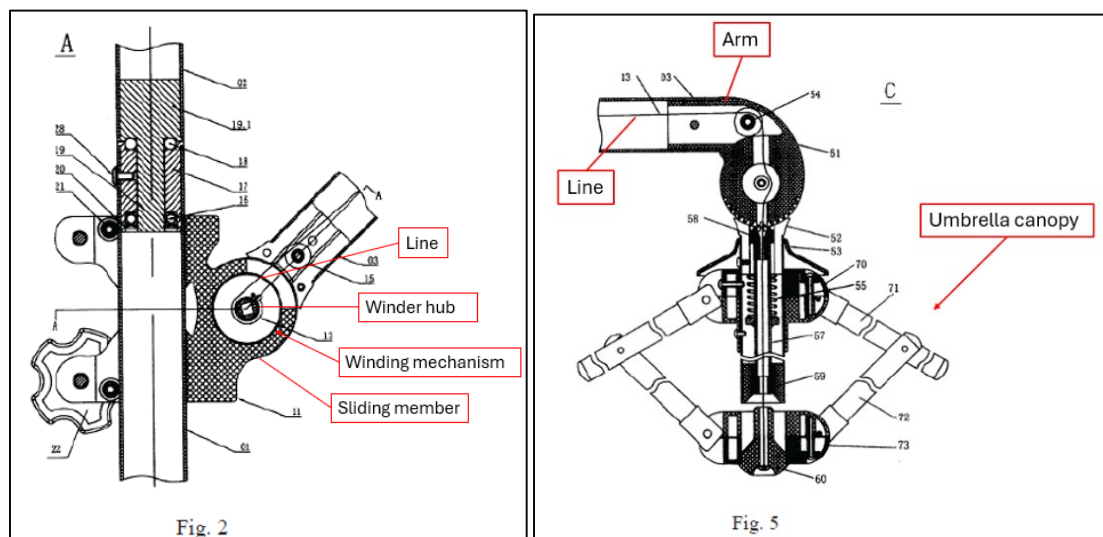
- h. Claim 1.g: “a winding mechanism having a winder hub around which a line can be wound, the winder hub being mounted to the sliding member and movable therewith”**

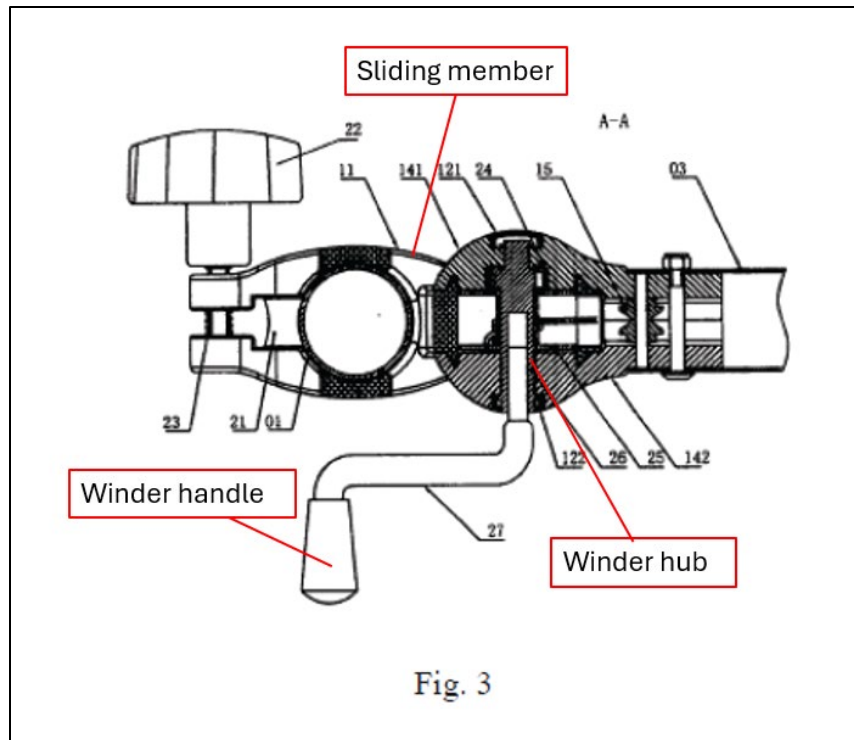
93. Wang '460 discloses a winding mechanism (rope winder) having a winder hub (rope reel 26) around which a line (pull rope 13) can be wound, the winder hub (rope reel 26) being mounted to the sliding member (sliding sleeve 11) and movable therewith. Wang '460 explains that “[t]he rope reel 26 of a winder handle 27 is tied with a pull rope 13, and the other end of the pull rope passes through the suspension rod 03 through a pulley 15 and the top tube 57 installed in the upper parasol disc 70, so as to be fixed to the lower parasol disc 73.” *Id.* at 17 and 20 (Figures 2 and 3 (see annotated below)). Further, Claim 1 recites “the sliding sleeve comprises a rope winder and is shaft-connected to a bottom end of the suspension rod (03), a top end of the suspension rod (03) and an upper parasol disc (70) of the parasol frame have a pitch rotating connection structure, one end of a pull rope (13) is fixed to a reel (26) of the rope winder installed in the sliding sleeve (11), and the other end thereof passes through the suspension rod (03) and a top tube (57) installed in the upper parasol disc to be fixed to a lower parasol disc.” Ex. 1007 at 12.

- i. Claim 1.h: “a line having a first end that winds around the winder hub, an intermediate portion extending from the winder hub along the arm to the umbrella canopy, and a second end that engages the umbrella canopy”**

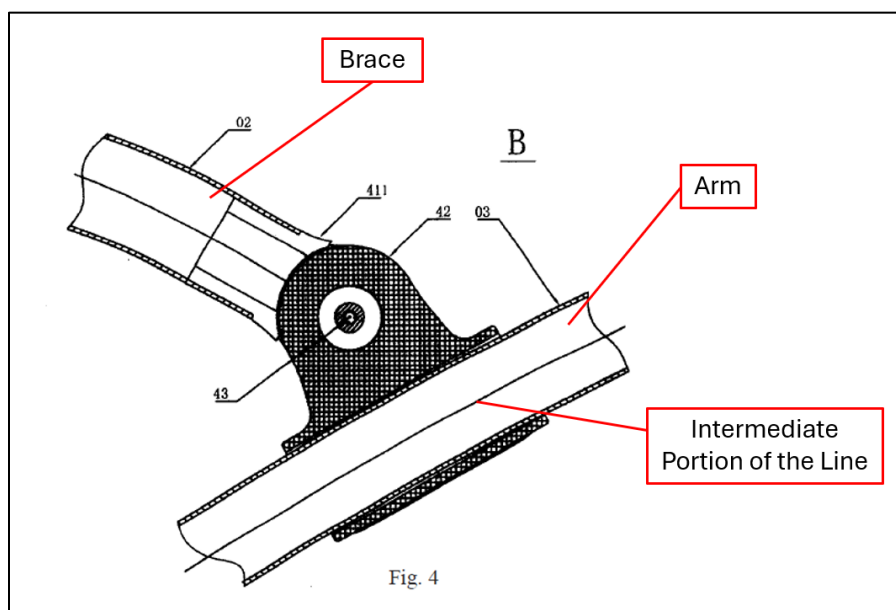
94. Wang '460 discloses a line (pull rope 13) having a first end that winds around the winder hub (rope reel 26), an intermediate portion extending from the

winder hub (rope reel 26) along the arm (suspension rod 03) to the umbrella canopy (a parasol cover 112), and a second end that engages the umbrella canopy (a parasol cover 112). As shown in Figures 2, 3, and 5 (annotated below), “the sliding sleeve comprises a rope winder and is shaft-connected to a bottom end of the suspension rod (03), a top end of the suspension rod (03) and an upper parasol disc (70) of the parasol frame have a pitch rotating connection structure, one end of a pull rope (13) is fixed to a reel (26) of the rope winder installed in the sliding sleeve (11), and the other end thereof passes through the suspension rod (03) and a top tube (57) installed in the upper parasol disc to be fixed to a lower parasol disc.” Ex. 1007 at 12 (claim 1) and 20-21 (Figures 2, 3, and 5). *See id.* at 10-11 and 17.





95. An intermediate portion of the line is seen in Fig. 4, which shows a detail between the portions shown in Figs. 2 and 5.



j. Claim 1.i: “wherein rotation of the winder hub tensions or relaxes the line depending upon the direction of rotation of the winder hub”

96. Wang ’460 discloses wherein operation of the winder hub (rope winder including the reel 26) tensions or relaxes the line (pull rope 13) depending upon the direction of the rotation of the winder hub (rope reel 26).

97. Wang ’460 explains tensioning the line as follows: “When opening the parasol, . . . the rope winder is then operated to wind the parasol rope so as to lift the lower parasol disc, . . . the parasol support of the lower parasol disc pushes the parasol ribs to open the parasol cover. . .” Ex. 1007 at 15-16. Wang ’460 also describes relaxing the line stating, “the parasol rope can be slightly loosened to disengage the top tube from the joint.” *Id.* at 17.

98. Wang ’460 teaches that “the sliding sleeve comprises a rope winder [i.e., the reel 26] and is shaft-connected to a bottom end of the suspension rod (03), a top end of the suspension rod (03) and an upper parasol disc (70) of the parasol frame have a pitch rotating connection structure, one end of a pull rope (13) is fixed to a reel (26) of the rope winder installed in the sliding sleeve (11), and the other end thereof passes through the suspension rod (03) and a top tube (57) installed in the upper parasol disc to be fixed to a lower parasol disc.” Ex. 1007 at 12 (claim 1). *See id.* at 10-11, 17, 20-21. A POSITA would understand that when the user winds the

rope winder, the rope is tensioned or relaxed depending on the direction of rotation of the rope winder.

k. Claim 1.j: “wherein operation of the winding mechanism to apply tension to the line opens and closes the umbrella canopy in response to movement of the line”

99. Wang '460 discloses wherein operation of the winding mechanism (rope winder including the reel 26) to apply tension to the line (pull rope 13) opens and closes the umbrella canopy (parasol surface/parasol cloth) in response to movement of the line (pull rope 13). Wang '460 states “the parasol cover can be easily opened and closed... the rope winder is then operated to wind the parasol rope so as to lift the lower parasol disc” to open the umbrella (Ex. 1007 at 15) and “the sliding sleeve includes a rope winder and is shaft-connected to a bottom end of the suspension rod, a top end of the suspension rod and an upper parasol disc of the parasol frame have a pitch rotating connection structure, one end of a pull rope is fixed to a reel of the rope winder installed in the sliding sleeve, and the other end thereof passes through the suspension rod and a top tube installed in the upper parasol disc to be fixed to a lower parasol disc. The structure of the present utility model makes the parasol cover easy to open and close, the parasol cover can rotate 360° around the parasol pole, and the pitch angle thereof can also be adjusted.” Ex. 1007 at 12 (claim 1). *See id.* at 10-11 and 17. A POSITA would understand that

operation of the rope winder would apply tension to the pull rope to open and close the umbrella canopy in response to movement of the pull rope.

I. Claim 1.k: “wherein the angle of the umbrella canopy with respect to the main pole can be controlled by moving the sliding member along the main pole”

100. Wang '460 discloses wherein the angle of the umbrella canopy (parasol surface/parasol cloth) with respect to the main pole (parasol pole 1) can be controlled by moving the sliding member (sliding sleeve 11) along the main pole (parasol pole 1). A POSITA viewing the Wang '460 disclosure would recognize that sliding sleeve 11 can be moved along the vertical axis of the main pole (parasol pole 01) without loosening the parasol rope 13 to control the angle of the umbrella canopy with respect to the main pole. Wang '460 discloses “when it is necessary to change the shielding position of the parasol, the sliding sleeve 11 is slightly loosened, the parasol cover 112 is pushed to drive the suspension rod 03 and the pull rod 02 to rotate horizontally around the parasol pole 01, and then the rotating handle 22 is tightened. When it is necessary to change the pitch angle of the parasol, the parasol rope 13 can be slightly loosened to disengage the upper plug 58 from the joint 51, then the parasol covered is moved to adjust the pitch angle to reach a suitable angle where the normal line of the parasol cover points to the sun, and then the parasol rope 13 is tightened so that the upper plug 58 rises and re-engages the joint 51 for positioning, so that the parasol cover is stable.” Ex. 1007 at 18. *See id.* at 15-16. A

POSITA would recognize that when the sliding sleeve 11 is loosened, the sleeve 11 can be moved about the longitudinal axis of the pole 01 (i.e., along a circumferential surface) to change a rotational angle of the parasol cover (umbrella canopy) about a longitudinal axis of (i.e., with respect to) the main pole. Also, a POSITA would recognize that sliding sleeve 11 can be moved along the longitudinal axis of the main pole (parasol pole 1) without loosening the parasol rope 13 to control the angle of the umbrella canopy with respect to the main pole.

101. To the extent this element is not disclosed in Wang '460, Tung '037 states “[r]eferring to FIG. 5, when adjustment of the tilting angle of the canopy 3 is required, the lever 16 is released to allow the adjusting sleeve 14 to move downwardly along the supporting rod 12. The arcuate tube 24 (including the outer tube section 24a and the inner tube section 24b) slid along the holding sleeve 18 until a desired tilting angle of the canopy 3 is reached for optimum shade. The lever 16 is then switched to its locked position.” Ex. 1011 at 5:56-63.

102. Additionally, Tung '037 explains that umbrellas like Wang '460 are “troublesome” because “the user has to lower the canopy to a reachable level (otherwise a chair or the like is required to reach the canopy), rotate the canopy, and raise the canopy again.” As a result, “the user must operate the mechanism for adjusting the height of the canopy twice,” or “otherwise a chair or the like is required to reach [and adjust] the canopy.” Tung '037 teaches an umbrella device wherein

the locking means is situated on the sleeve. Tung's sleeve design allows a user to adjust the umbrella at the sleeve without separately interacting with the raised canopy or adjusting the height of the canopy multiple times.

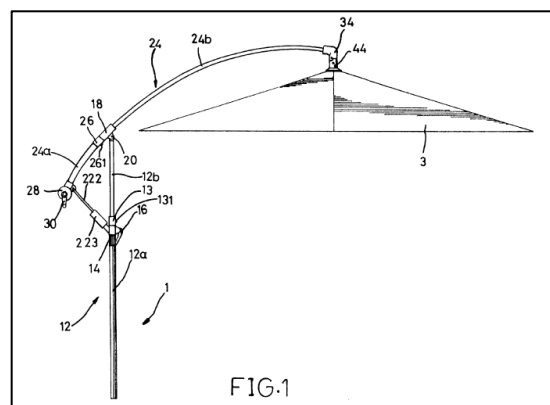
103. Additionally, for similar reasons stated in Section VI.A.1.d.i (*supra* Section VI.A.1.d.i), a POSITA would be motivated to combine these references to accomplish the goals stated in both references and it would have been obvious and predictable to a POSITA to modify the Wang '460 umbrella to have the sliding sleeve and locking means disclosed in Tung '037 for adjusting the angle of the canopy and to improve the umbrella.

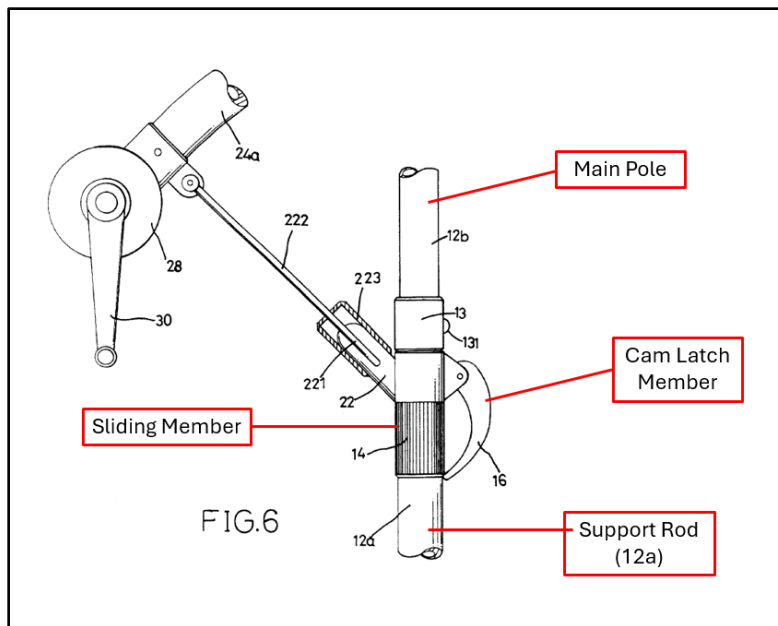
104. Accordingly, Wang '460 in view of Tung '037 renders claim 1 as obvious under pre-AIA 35 U.S.C. § 103.

- 2. Claim 2: “[t]he umbrella of claim 1, wherein the locking means for releasably securing the sliding member to the main pole comprises a cam latch member having a cam surface, the cam latch member being rotatable with respect to the sliding member between a first position in which the cam surface causes the sliding member to be clamped against the main pole, and a second position in which the cam surface permits movement of the sliding member with respect to the main pole.”**

105. To the extent Wang '460 does not disclose this, Tung '037 discloses a locking means for releasably securing the sliding member (adjusting sleeve 14) to the main pole (supporting rod 12) that comprises a cam latch member (lever 16) having a cam surface, the cam latch member (lever 16) being rotatable with respect

to the sliding member (adjusting sleeve 14) between a first position in which the cam surface causes the sliding member (adjusting sleeve 14) to be clamped against the main pole (supporting rod 12), and a second position in which the cam surface permits movement of the sliding member (adjusting sleeve 14) with respect to the main pole (supporting rod 12). For example, Tung '037 states “[t]he main frame 1 includes a supporting rod 12, an adjusting sleeve 14 slidably mounted around the supporting rod 12, and a lever 16 mounted to the adjusting sleeve 14. When the lever 16 is in a locked position, the adjusting sleeve 14 is frictionally retained in place, and when the lever 16 is in a released position, sliding movement of the adjusting sleeve 14 relative to the supporting rod 12 is allowed.” Ex. 1010 at 3:36-46. *See id.* at 4:57-63 and Figures 1,5, and 6-10. Figure 1 and an annotated Figure 6 are reproduced below.





i. Motivation to combine Wang '460 with Tung '037

106. A POSITA would have understood that a simple substitution of the locking mechanism in Wang '460 with the cam latch locking mechanism of Tung '037 would yield predictable results for adjusting collapsible umbrella products and to secure the umbrella into place. Indeed, Wang '460 and Tung '037 both relate to collapsible umbrella products and are thus in the same industry. Moreover, the examiner for the '640 Non-Provisional Application also cited Tung '037 as prior art and the applicant did not deny it. Ex. 1002 at 93-96 and 106. For similar reasons stated in Section VI.A.1.d.i (*supra* Section VI.A.1.d.i), a POSITA would be motivated to combine these references to accomplish the goals stated in both references. A POSITA would have understood that a simple substitution of the locking mechanism in Wang '460 with the cam latch locking mechanism of

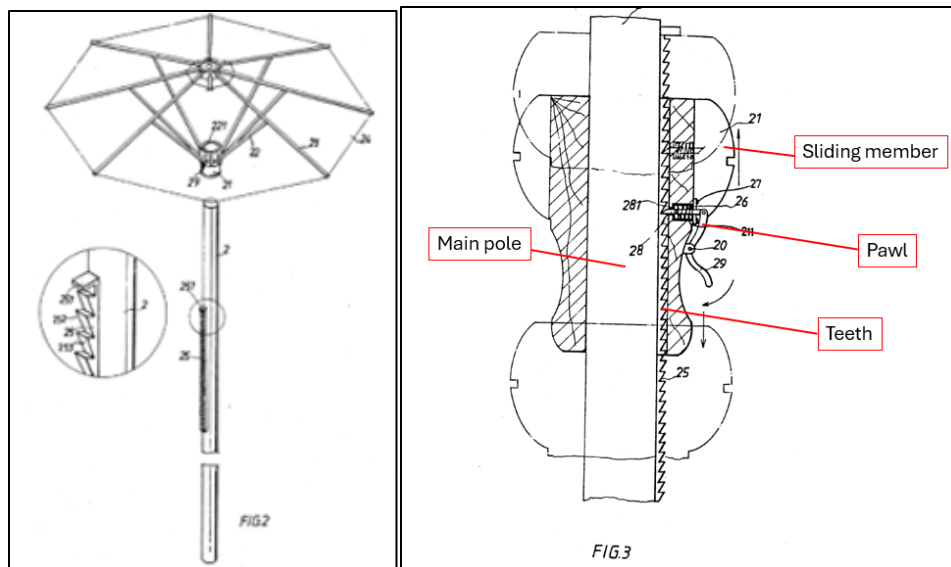
Tung '037 would yield predictable results to improve adjustable umbrella of Wang '460.

107. Thus, Wang '460 in view of Tung '037 renders claim 2 as obvious under pre-AIA 35 U.S.C. § 103.

- 3. Claim 3: “[t]he umbrella of claim 1, wherein the locking means for releasably securing the sliding member to the main pole comprises a plurality of teeth formed on the main pole and a cooperating pawl associated with the sliding member and selectively operative to engage a selected one of the teeth to prevent movement of the sliding member with respect to the main pole.”**

108. To the extent this limitation is not disclosed in Wang '460, Liu '171 discloses this.

109. The Abstract of Liu '171 discloses a “rack-like member is equipped with a plurality of consecutive Z-shaped teeth” located on the main shaft of the sunshade where the sliding member can slidably move along the rack. Ex.1011 at Abstract; 2:21-38; 3:1-6. The front tip of the supporting pin located on the runner engages “with the teeth of the rack-like member and can disengaged there with by actuation of the arc arm so as to make the supporting pin retrievably actuated.” Ex.1011 at Abstract. *See* Ex.1011 at 1:19-31, 2:21-38, 3:10-30. The movement of the runner allows the user to manipulate the sunshade. *Id.* at 3:31-49. *See* Ex.1011 at Figures 2 and 3 (annotated below).



i. Motivation to combine Wang '460 with Liu '171

110. A POSITA would have understood that a simple substitution of the known locking means in Wang '460 with the known locking means in Liu '171 would yield predictable results to improve adjusting collapsible umbrella products and to secure the umbrella into place. Indeed, Liu '171 and Wang '460 both relate to collapsible umbrella products and are thus in the same industry. Moreover, the examiner for the '640 Non-Provisional Application found that Liu '171 was prior art that taught one how “to modify the locking means ... by using a teeth-and-pawl means as taught by Liu ['171].” Ex. 1002 at 141-142 (June 24, 2010 Non-Final Office Action). The applicant did not respond to the examiner’s characterization that Liu '171 was prior art. *Id.* at 93-96.

111. Similar motivations to combine are also found in both references. Wang '460 states that prior umbrella designs are “complicated, and the opening and closing

of the parasol cover is quite inconvenient” and “unstable when the parasol cover is opened.” Ex. 1007 at 14. Liu ’171 explains how teeth disposed on the main shaft of the umbrella provide several advantages, including: (1) allowing operation by operators who are too weak to open a heavy sunshade with one hand; (2) reducing the danger that a user will injure their fingers in the crevice formed by the main shaft and runner; (3) making operation of the umbrella more convenient; and (4) reducing the effort required to operate the sunshade. Ex. 1011 at 1:57-2:11, 2:38-42, 3:50-4:8.

112. Liu ’171 also explains that, since “[t]he size of the sunshade is usually very large so that it can keep a wide area covered” and “the larger the sunshade is the heavier it becomes,” prior art umbrellas which “keep a wide area covered” require “great effort” to operate because the operator must “hold the runner in place with one hand” and operate the locking device with the other. Ex. 1011 at 1:56-66. A POSITA would recognize that the locking means disclosed in Wang ’460, a “hoop-type sliding sleeve 11 locked by a bolt,” requires holding the sliding sleeve in place while using the other hand to lock it. Ex. 1007 at 17 and 20 (Figure 3).

113. Thus, a POSITA would understand to use the locking mechanism used in Liu ’171 to improve the ease of use of the umbrella and to achieve the goals recited in Wang ’460 and Liu ’171.

114. Thus, Wang ’460 in view of Liu ’171 renders claim 3 as obvious under pre-AIA 35 U.S.C. § 103.

4. **Claim 4: “[t]he umbrella of claim 1, wherein the locking means for releasably securing the sliding member to the main pole comprises a plurality of holes formed in the main pole and a pin associated with the sliding member and operative to engage a selected one of the holes.”**

115. To the extent Wang ’460 does not teach this, Bertola ’895 discloses a locking means for releasably securing the sliding member. Specifically, Bertola describes the locking means as follows: “the sleeve comprises a handling means, e.g. a handle, and a latch or the like is operable by means of a button that is preferably arranged on the handle, whereby the latch engages in a hole of the mast or the outer tube for the purpose of axial fixation of the slider on the mast. In order to adjust the slider, the latch is operated by means of the button and is removed from the hole so that the height of the slider on the mast can be adjusted. The latch then enters a further hole of the mast or the outer tube in order to fix the slider.” Ex. 1013 at 28.

i. Motivation to combine Wang ’460 with Bertola ’895

116. A POSITA would have understood that a simple substitution of the locking mechanism of Wang ’460 with pin and hole structure of Bertola ’895 would yield predictable results to improve adjusting collapsable umbrella products and to secure the umbrella into place. Indeed, Wang ’460 and Bertola ’895 both relate to collapsable umbrella products and are thus in the same industry.

117. Both references also disclose similar motivations to combine. For example, Wang ’460 states that prior umbrella designs are “complicated, and the

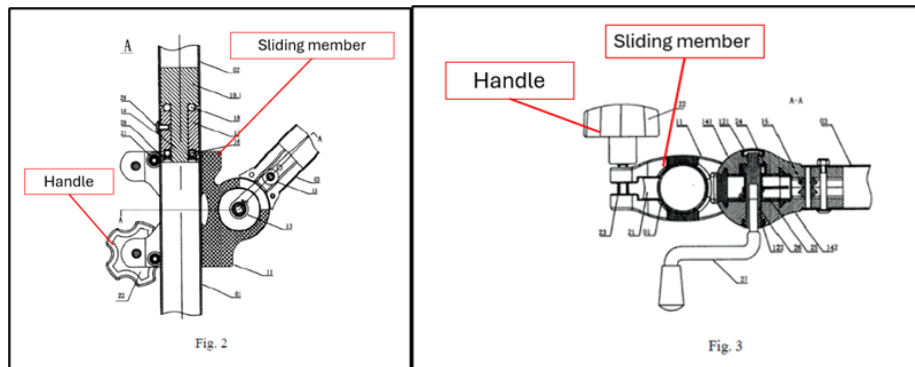
opening and closing of the parasol cover is quite inconvenient” and “unstable when the parasol cover is opened.” Ex. 1007 at 14. And Bertola ’895 states that one disadvantage of a prior umbrella is “the height-adjustable boom being quite difficult to adjust via both a fork and a locking bolt, which engages into a hole in the mast.” Ex. 1013 at 38. Bertola further states that one advantage of their invention is that “the boom is height-adjustable and fixable on the mast in a quite straightforward manner, as a result of which the tilt angle of the boom is variable in a quick and straightforward manner.” *Id.* Bertola ’895 goes to explain that one aspect of this is that “the sleeve comprises a handling means, e.g. a handle, and a latch or the like is operable by means of a button that is preferably arranged on the handle, whereby the latch engages in a hole of the mast or the outer tube for the purpose of axial fixation of the slider on the mast.” *Id.* Thus, a POSITA would have been motivated to use the locking mechanism of Bertola ’895 achieve the goals stated in Wang ’460.

118. Thus, Wang ’460 in view of Bertola ’895 renders claim 4 as obvious under pre-AIA 35 U.S.C. § 103.

5. Claim 5: “[t]he umbrella of claim 1, wherein the sliding member has a handle associated therewith.”

119. Wang ’460 discloses wherein the sliding member (sliding sleeve 11) has a handle (rotating handle 22) associated therewith.

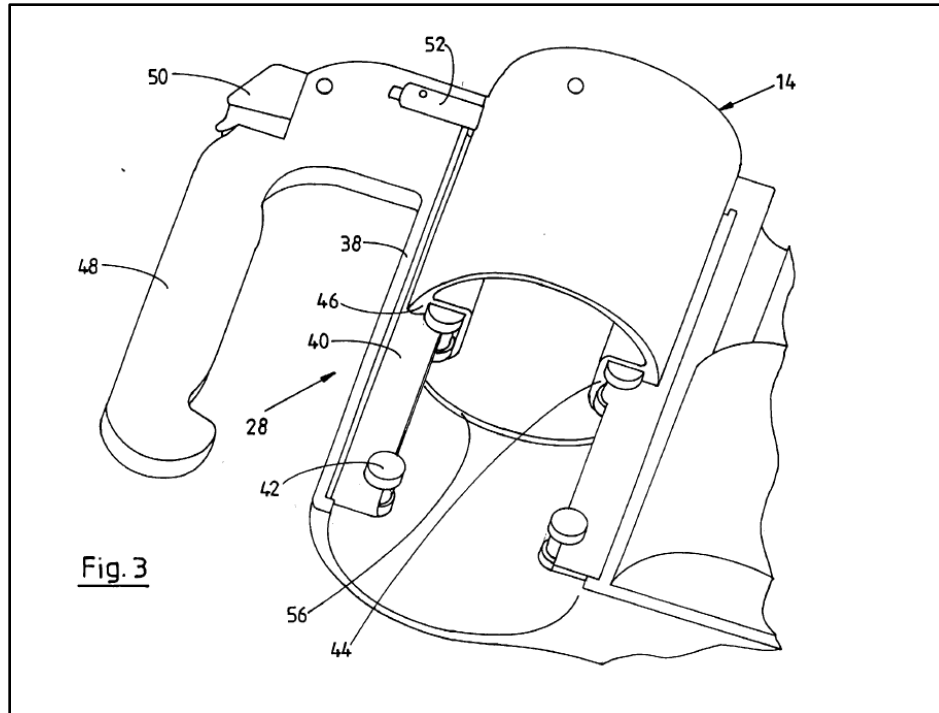
120. As shown in Figures 2 and 3 (annotated below), “[t]he parasol pole 01 is equipped with a hoop-type sliding sleeve 11 locked by a bolt” and “[o]ne end of the bolt is equipped with a rotating handle 22, and a spring 23 is sleeved on the bolt portion between the hoop chucks.” Ex. 1007 at 17 and 20.



121. Thus, Wang '460 renders claim 5 as obvious under pre-AIA 35 U.S.C. § 103.

i. In the alternative, Wang '460 in view of Bertola '895 renders Claim 5 obvious.

122. To the extent that Wang '460 does not disclose this limitation, Bertola '895 discloses a handle on the sliding member as shown below in Fig. 3. Ex. 1013 at Figure 3.

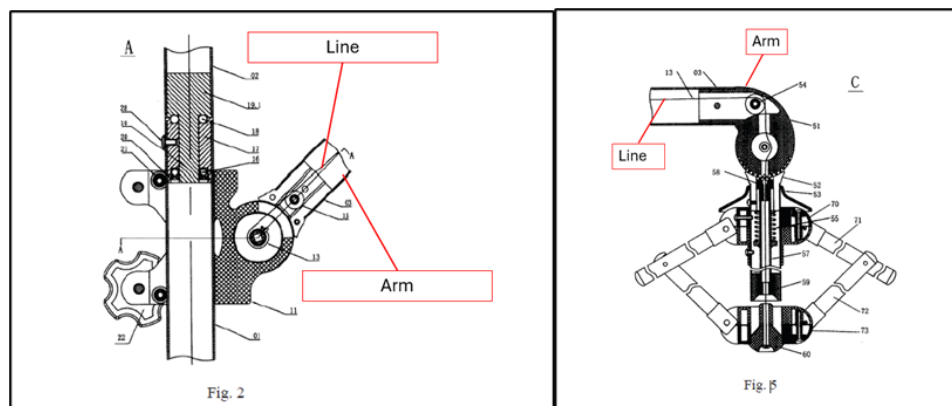


123. Bertola '895 explains that the slider 28 further comprises a handle 48, which is preferably integrally connected to the sleeve 38. Ex. 1013 at 30. As explained above, a POSITA would have understood that a simple substitution of the sliding member in the Wang '460 umbrella with the slider on the Bertola '895 umbrella would yield predictable results to provide a structure to manipulate the sliding member. Both umbrellas use a sliding member for adjusting the umbrella and have a similar device for locking the sliding member in place along the main pole. *Id.* The added benefit of the handle on the Bertola sliding member would have motivated a POSITA to make this substitution. *Id.*

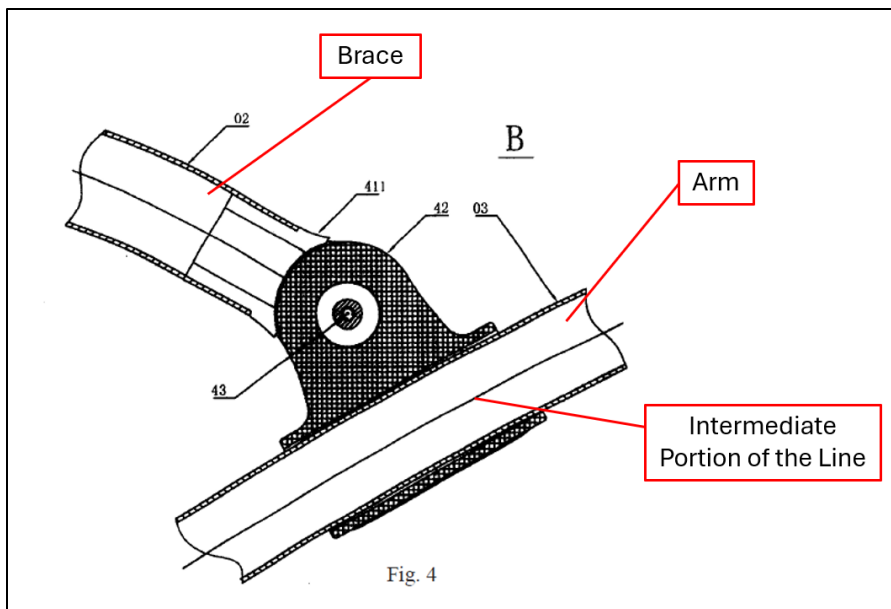
124. Thus, Wang '460 in view of Bertola '895 renders claim 5 as obvious under pre-AIA 35 U.S.C. § 103.

6. Claim 6: “[t]he umbrella of claim 1, wherein the line extends along at least substantially the entire length of the arm.”

125. Wang '460 disclose wherein the line (pull rope 13) extending along at least substantially the entire length of the arm (suspension rod 03). As shown in Figures 2 and 5 (annotated below), “one end of a pull rope is fixed to a reel of the rope winder installed in the sliding sleeve, and the other end thereof passes through the suspension rod and a top tube installed in the upper parasol disc to be fixed to a lower parasol disc.” Ex. 1007 at 10-11, 12 (claim 1), 15, and 20-21 (Figures 2 and 5).



126. Between these end portions, the intermediate section of the line extends along the arm (suspending rod 03) as seen in Fig. 4 (annotated below).



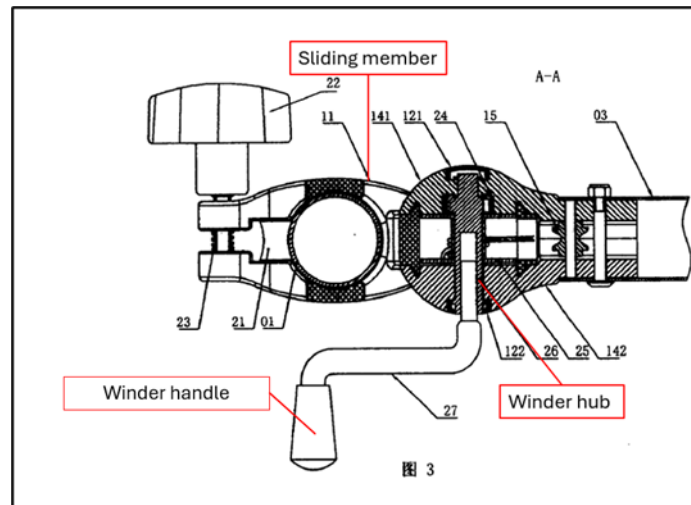
127. Thus, Wang '460 renders claim 6 as obvious under pre-AIA 35 U.S.C. § 103.

7. **Claim 7: “[t]he umbrella of claim 1, further comprising a crank handle operatively associated with the winder hub, whereby rotating the crank handle causes the winder hub to rotate.”**

128. Wang '460 discloses a crank handle (winder handle 27) operatively associated with the winder hub (rope reel 26) whereby rotating the crank handle (winder handle 27) causes the winder hub (rope reel 26) to rotate. As shown in Figure 3 (annotated below), the sliding sleeve 11 is connected to the spherical left and right casings 141 and 142 of the rope winder. The rope reel 26 of a winder handle 27 is tied with a pull rope 13, and the other end of the pull rope passes through the suspension rod 03 through a pulley 15 and the top tube 57 installed in the upper

parasol disc 70, so as to be fixed to the lower parasol disc 73.” Ex. 1007 at 17 and 20

(Figure 3).



129. Thus, Wang '460 renders claim 6 as obvious under pre-AIA 35 U.S.C.

B. Ground 2: The Challenged Claims of the '492 Patent are Obvious over Ma '763 in view of Bertola '895 and in further view of Ma '297 and further view of Tung '037 and Liu '171

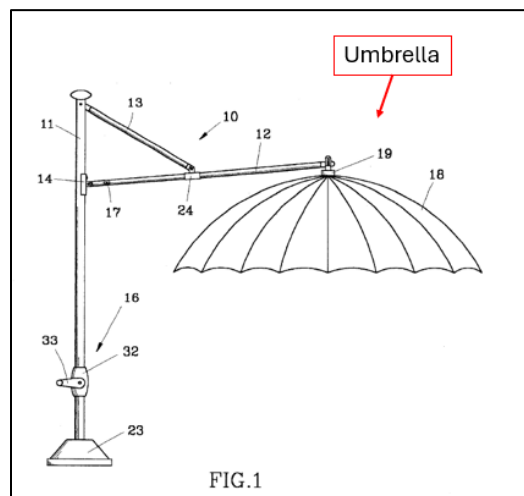
130. Based on my review and analysis, Ma '763 in view of Bertola '895 and in further view of Ma '297 render claims 1, 4, and 5-7 as obvious under pre-AIA 35 U.S.C. § 103. Ma '763 in view of Tung '037 and in further view of Ma '297 render claim 2 as obvious under pre-AIA 35 U.S.C. § 103. Ma '763 in view of Liu '171 and in further view of Ma '297 render claim 3 as obvious under pre-AIA 35 U.S.C. § 103.

1. Claim 1

131. Based on my review and analysis, Ma '763 in view of Ma '297 and in further view of Bertola '895 renders claim 1 as obvious under pre-AIA 35 U.S.C. § 103.

a. Preamble: “An umbrella comprising”

132. Ma '763 generally discloses an “umbrella” device. Ex. 1009 at Title, Abstract, 2:50-52, Figure 1.

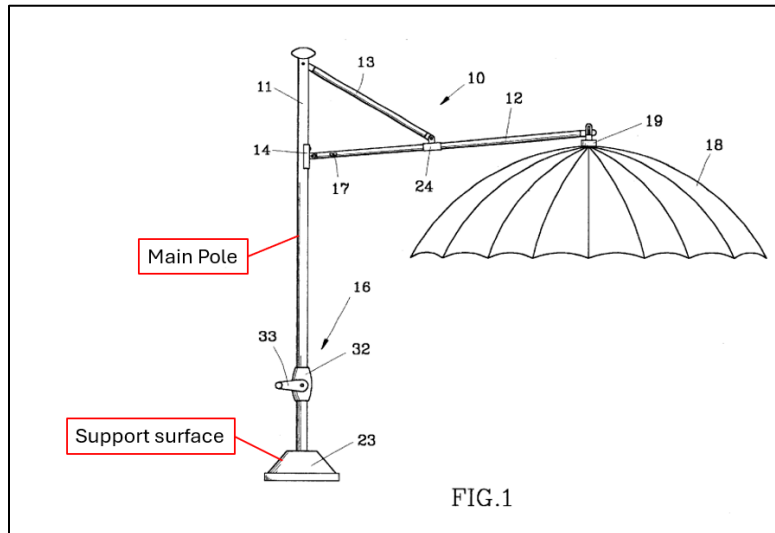


b. Claim 1.a: “a main pole having a lower end for support by a support surface and extending generally upward to an upper end”

133. Ma '763 discloses a main pole (support pole 11) having a lower end for support by a support surface (base 23) and extending generally upward to an upper end. As shown in Figure 1 (annotated below), support pole “stands upright with a lower end thereof supported by a base 23” and the “link 13 has two ends respectively

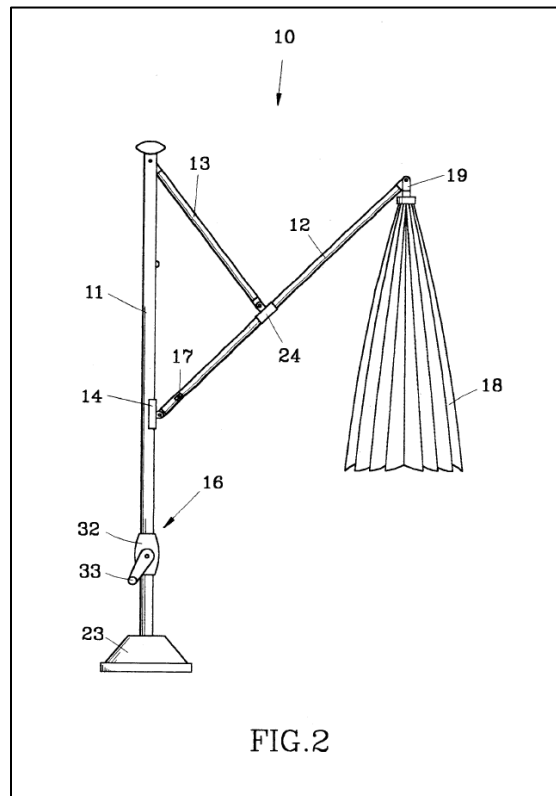
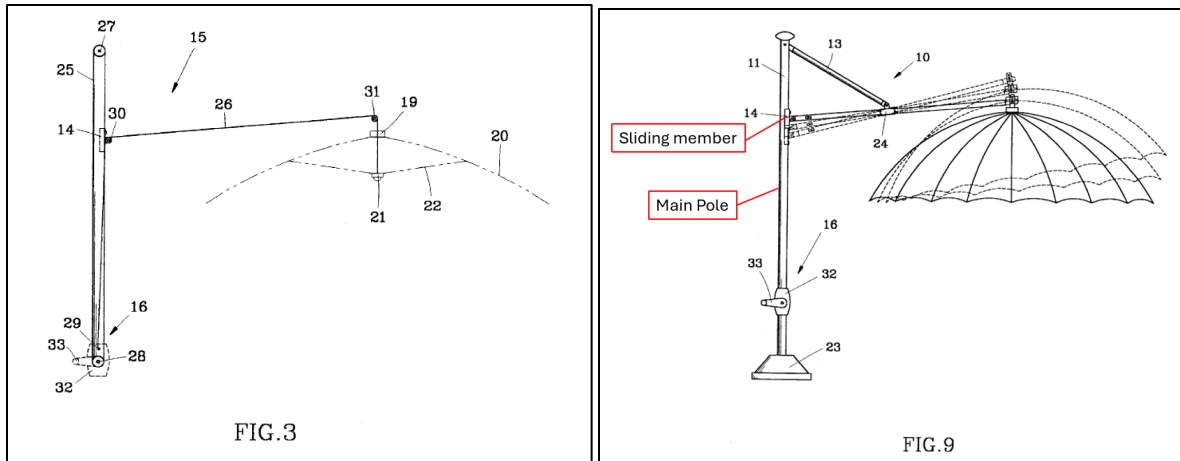
pivotally connected to an upper end of the pole 11 and the pivot joint 24.” Ex. 1009

at 2:52, 3:9-11, 3:20-22. *See id.* at 5:43-6:28 (claim 1).



c. Claim 1.b: “a sliding member associated with the main pole and selectably moveable thereon between lower and upper locations along the main pole”

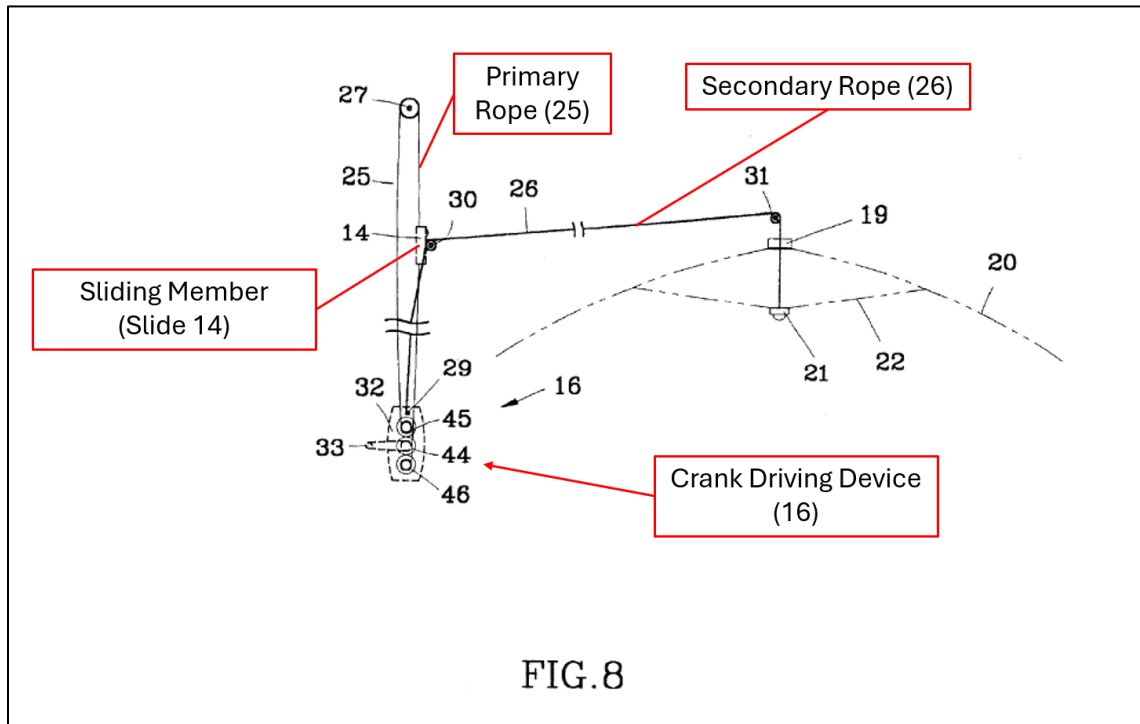
134. Ma ’763 discloses a sliding member (slide 14) associated with the main pole (support pole 11) and selectably moveable thereon between lower and upper locations along the main pole (support pole 11). As shown in Figure 9 (annotated below), Ma ’763 explains that “an arm 12 movable mounted to the support pole 11 by a slide 14” Ex. 1009 at 2:49-59. *See id.* at 3:13-32, 4:41-52, 4:61-67, 5:33:-35, 5:43-6:28 (claim 1), Figures 3 and 9 (see annotated below).



- d. **Claim 1.c: “locking means for releasably securing the sliding member to the main pole at a selected location along the main pole”**

135. The Ma ’763 umbrella has a locking device for releasably securing the sliding member (slide 14) to the main pole at a selected location. Specifically, as

shown below in annotated Figure 8, “[t]he slide 14 is attached to the primary rope 25 and slidable along the pole 11 so that when the primary rope 25 is driven by the crank driving device 16, the slide 14 is moved along the pole 11 and thus causing the arm 12 to move with respect to the pole 11.” Ex. 1009 at 3:13-16.



136. Ma '763 explains that “[t]he primary rope 25 forms a loop coupled between the axle 28 and the pulley 27. When the crank member 33 is actuated, the primary rope 25 is driven to move between the axle 28 and the pulley 27, which in turn drives the slide 14 to move along the pole 11.” Ex. 1009 at 3:63-67. Thus, the primary rope 25, in combination with the crank member 33, axle 28, and pulley 27, acts as a locking device that secures the sliding member 14 at a selected location along the main pole.

137. The elevation of the slide due to the operation of the primary rope 25 also simultaneously tensions the secondary rope 26 to open the canopy. For example, Ma '763 explains that “a locking device 17” “is provided inside the arm 12” “to fix the secondary rope 26 at the tensioned condition associated with the locked condition of the crown 19.” Ex. 1009 at 4:22-25. Ma '763 further explains that “when the slide 14 is driven by the movement of the primary rope 25 to slide toward the upper end of the pole 11, the distance between the slide 14 and the pin 29 that fixes the proximate end of the secondary rope 26 to the pole 11 is increased, which causes the runner 21 to move toward the crown 19 and thus open the panel.” Ex. 1009 at 4:41-47. As a result, “[s]ince the movement of the slide 14 is controlled by the primary rope 25 in a continuous manner, the rotation of the arm 12 with respect to the slide 14 is, in general, stepless. In other words, the panel 18 may be opened to any extent between the open position and closed position in a stepless fashion.” Ex. 1009 at 4:61-66.

138. While the locking device disclosed in Ma '763 is not one of the three structures corresponding to the § 112 ¶ 6 limitation “locking means” in the '492 Patent, it would have been obvious to a POSITA to substitute one of those structures for the locking device in the Ma '763 umbrella. For example, as discussed above, Bertola '895 discloses a pin and hole locking structure that corresponds with the

latch-pin and hole locking means structure described in the '492 Patent. Ex. 1013 at 302.

i. Motivation to combine Ma '763 with Bertola '895

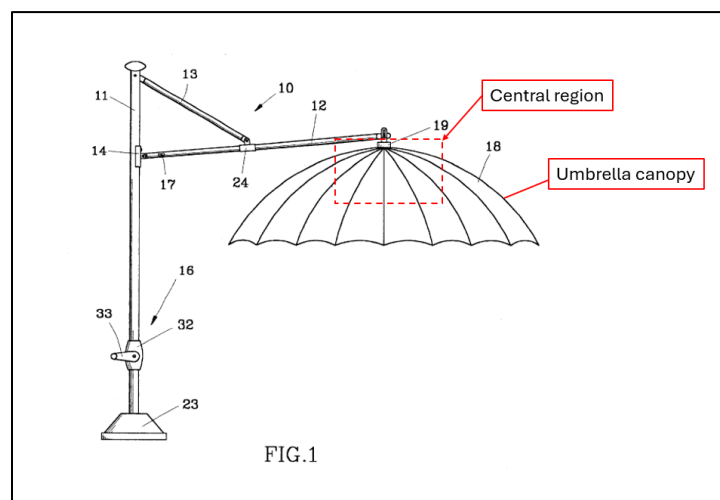
139. A POSITA would have understood that a simple substitution of the primary rope used to lock the sliding member in Ma '763 with the known pin and hole mechanism of Bertola '895 would yield predictable results and would improve the Ma '763 umbrella. A POSITA would understand that replacing the ropes and pulleys in the Ma '763 locking means would improve durability. Specifically, the slide 14 is locked into place by the tension of the primary rope 25 holding the slide. Ex. 1009 at 3:12-16 and 3:57-67. The slide staying in place, and therefore holding the umbrella in place, depends on the integrity of the rope which can weaken for many reasons, including by degradation and wear of the primary rope 25 operating over the pulley 27. A failure in the integrity of the rope would result in the collapse of the umbrella and could lead to user injury. Moreover, prior art teaches that removing pulleys provides a better design by reducing opportunities for “defects ... caused by the breakage of the cord or jamming of the cord at one of the several pivot areas around which the cord is guided” and by providing a design that “can be operated independently of the position” of other mechanisms. Ex. 1015 at [0004], [0005], [0025].

140. A POSITA would also understand that using the pin and hole mechanism described in Bertola '895 to lock the slide in place instead of the primary rope 25, would allow the secondary rope 26 to operate independently of the position of the slide 15, such that a user could adjust the angle of the canopy independently from opening or closing the canopy. In the Ma '763 umbrella, the slide 14 must be fully elevated to sufficiently tension the secondary rope 26 to cause the canopy to be in a fully open position and the secondary rope 26 must then be locked before the user can adjust the angle of the canopy through moving the slide 14 because primary rope 25 has dual functions for (a) opening and closing the canopy and (b) positioning the angle of the canopy. Ma '763 explains that once the Ma '763 umbrella is fully opened, locking device 17 can hold the umbrella in the open position by locking secondary rope 26 in place. Ex. 1009 at 4:52-61 and Figure 6. Then, “[f]urther driving of the primary rope 25 to move the slide 14 causes the panel 18 [the canopy] to rotate to a different direction, as indicated by the dashed lines shown in FIG. 9.” Ex. 1009 at 4:58-61. Using the pin and hole mechanism described in Bertola '895 to lock the slide in place instead of the primary rope 25, would allow a user to adjust the angle of the canopy independently from opening or closing the canopy. For example, if rope 26 functioned to open and close the canopy without any dependence on the position of the slide 14, and a pin and hole device locked the position of the slide, a user could partially open the canopy and then adjust the angle of the canopy

without having it fully open or a user could position the slide as desired and then open the canopy. That is not possible using the primary rope as the locking device where the primary rope also fully elevates the slide to open the canopy in a coordinate manner as described in Ma '763. Prior art further teaches that independent adjustment of the parasol canopy and the height of the parasol is advantageous. Ex. 1015 at [0020]. Thus, a POSITA would have been motivated to use the locking mechanism taught in Bertola '895 to remedy the drawbacks of the locking means in Ma '763.

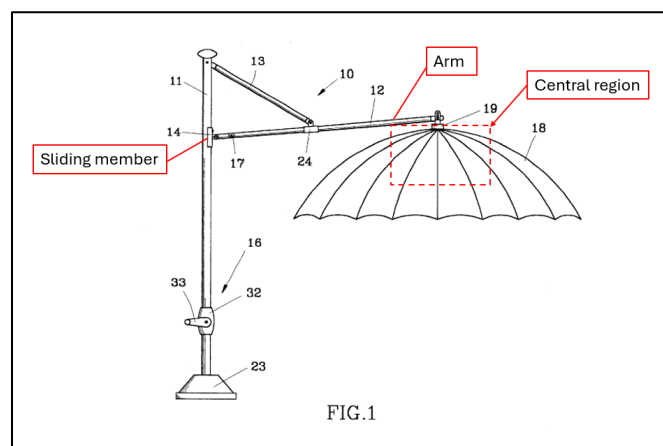
e. Claim 1.d: “an umbrella canopy having a central region”

141. Ma '763 discloses an umbrella canopy (panel 18 and crown 19) having a central region. As shown in Figures 1 and 3, Ma '763 discloses “[s]imilar to a conventional umbrella, the ribs 20 of the umbrella 10 of the present invention radially extend from a [central] crown 19 for supporting the panel 18.” Ex. 1009 at 2:60-3:2 and Figure 1.



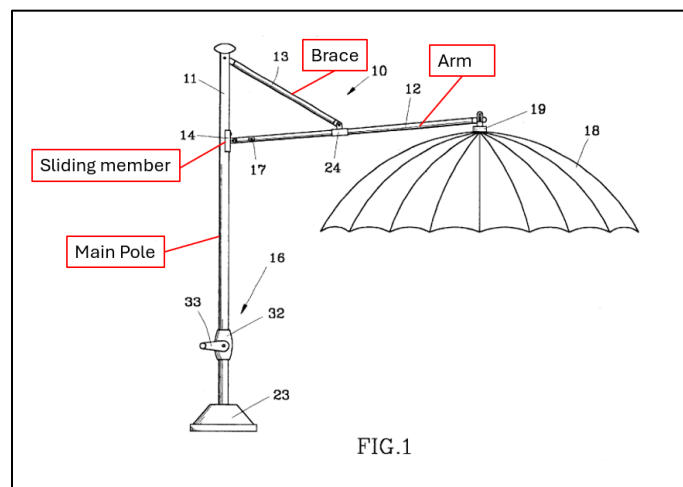
f. Claim 1.e: “an arm associated with the central region and extending radially therefrom to an outer end operatively associated with the sliding member”

142. Ma ’763 discloses an arm (arm 12) associated with the central region and extending radially therefrom to an outer end operatively associated with the sliding member (slide 14). As shown in annotated Figure 1, Ma ’763 has “an arm 12 movably mounted to the support pole 11 by a slide 14 and also coupled to the support pole 11 by a link 13, slide 14 for forming a frame to support” the canopy. Ex. 1009 at 2:52-55. Ma ’763 further teaches that “an arm has an end pivoted to the slide and is further supported by a link pivoted to both the pole and the arm” and that the “pulley 31 is mounted at the distal end of the arm 12 for aiding the passage of the secondary rope 26 through the crown 19 [of the central region of the umbrella canopy] to the runner.” Ex. 1009 at 2:52-53; 3:54-56, and Figure 1. *See id.* at 3:13-33, 4:4-11, 4:53-57, and 5:47-48 and 6:4-5 (claim 1).



- g. Claim 1.f: “a brace having a first end pivotably attached to an upper portion of the pole above the sliding member and a second end pivotably attached to the arm”**

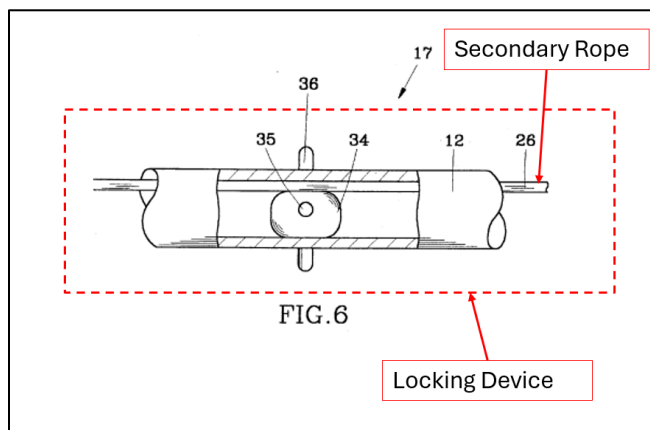
143. Ma ’763 discloses a brace (link 13) having a first end pivotably attached to an upper portion of the pole (support pole 11) above the sliding member (slide 14) and a second end pivotably attached to the arm (arm 12). As shown in annotated Figure 1, Ma ’763 discloses “[a]n arm has an end pivoted to the slide and is further supported by a link pivoted to both the pole and the arm” and “[a] pivot joint 24 is formed on the arm 12. The link 13 has two ends respectively pivotally connected to an upper end of the pole 11 and the pivot joint 24.” Ex. 1009 at 3:19-22 and Figure 1. *See id.* at Abstract, 1:62-64, 2:52-54, and 5:49-51 (claim 1).



- h. Claim 1.g: “a winding mechanism having a winder hub around which a line can be wound, the winder hub being mounted to the sliding member and movable therewith”**

144. Ma ’763 discloses a line securing device (locking device 17) mounted to the sliding member and movable therewith that controls the tension to the line

similarly to the winder hub in the umbrella of the '492 Patent. The winder hub in the '492 Patent anchors the line and increases or decreases tension in the line to open and close the canopy. Ex. 1001 at 3:41-49. Similarly, in Ma '763, locking device 17 anchors the line (secondary rope 26) to maintain the canopy in an open position. Ex. 1009 at 4:24-26.

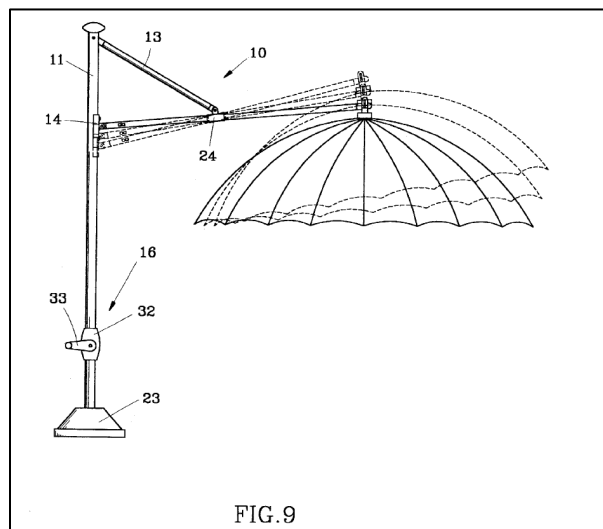


145. Ma '763 explains that “[t]he locking device 17 may be manually actuated to engage and thus fix the secondary rope 26. When the knob 36 is rotated by a user, the locking member 34 is moved in such a way so as to reduce the gap, and thereby pinch the secondary rope 26.” Ex. 1009 at 4:25-35 and 4:38-40. Ma '763 states that a POSITA would understand that the locking device 17 may be located on the sliding member (slide 14). Ex. 1009 at 4:36-40. Ex. 1009 at 4:36-40.

146. While Ma '763 has a mechanism that applies tension to a line (secondary rope 26) that can be attached to a sliding member (slide 14), Ma '763 does not disclose a winding mechanism having a winder hub on a sliding member.

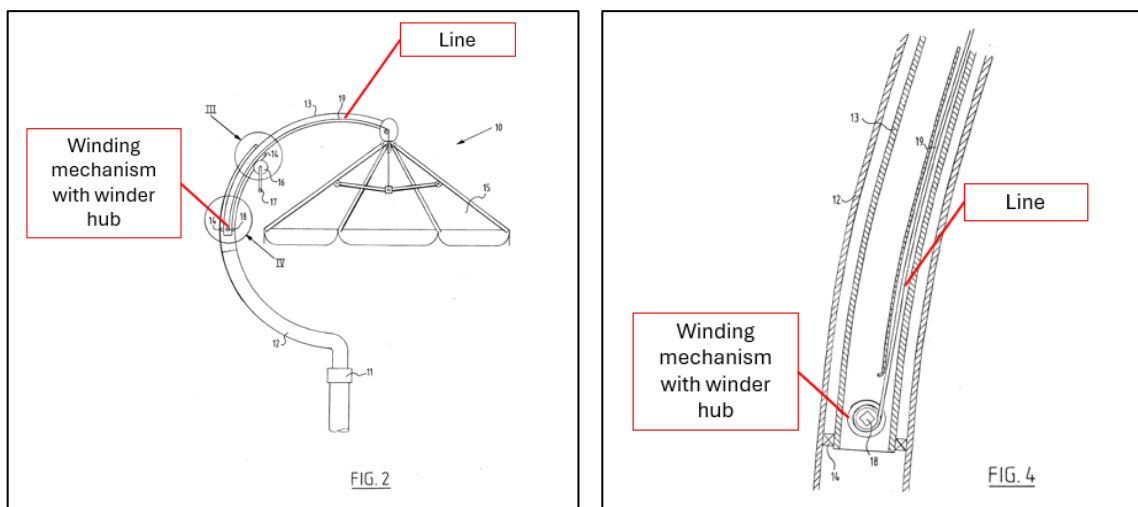
However, it would have been obvious to a POSITA to replace the locking device 17 in Ma '763 with a winder hub to make it easier to open and close the umbrella. It was well-known in the prior art to use a winder hub with a line to open and close a canopy. For example, Ma '297 discloses an umbrella device with a winding mechanism having a winder hub (reel 18) around which a line (cord 19) can be wound to open and close the umbrellas.

147. Ma '763 states that a POSITA would understand that the locking device 17 may be located on the sliding member (slide 14). Ex. 1009 at 4:36-40. A user can then manipulate slide 14 using the crank driving device 16 to perform any subsequent adjustment to the height of the deployed umbrella. Ex. 1009 at 4:15-21 and Figure 9.



148. To the extent Ma '763 does not disclose an umbrella device with a winding mechanism having a winder hub, Ma '297 discloses this. Ma '297 discloses

an umbrella device with a fixed main pole (first tubular element 12), an arm (second tubular element 13) coupled with the fixed pole, and “[i]nside the second tubular element 13[,] a reel 18 is present along which a cord 19 is wound, which is guided through the second tubular element 13 and is used to open and close the parasol 15.” Ex. 1015 at [0018], [0022], and Figure 2 and 4 (see annotated below). *See id.* at [0024].



i. Motivation to combine Ma '763 with Ma '297

149. A POSITA would have understood to combine Ma '297's reel 18 to replace Ma '763's locking device 17. Ma '763 and Ma '297 both relate to collapsable umbrella products and are thus in the same industry. Ma '763 states that the locking device can be placed on the arm 12 or on slide 14. Ex. 1009 at 4:36-40. Ma '297 states that eliminating pulleys provides a more robust design. In connection with identifying problems in the prior art, Ma '297 states that a “mechanism using a cord

for moving [a] second tubular element relative to [a] first tubular element is rather susceptible for defects for example caused by breakage of the cord or jamming of the cord at one of the several pivot areas around which the cord is guided.” Ex. 1015 at [0004]. This statement motivates reducing or eliminating one or more pivot areas (i.e., pulleys) from a mechanism that moves a second tubular element relative to a first tubular element. A POSITA would have understood that the same principle applies to a mechanism of an umbrella that moves umbrella canopy elements relative to one another to open and close an umbrella. Thus, a simple substitution of locking device 17 of Ma ’763 that maintains tension on the secondary rope with the reel 18 of Ma ’297 to create and/or maintain tension in the rope wound around the reel 18 would yield predictable results to improve collapsable umbrella products by reducing the number of pulleys used in the system. For example, the use of a reel 18 located on the slide 14 to apply tension through the secondary rope 26 through the arm 12 would eliminate the use of the pulley 30 in Ma ’763. Thus, this would address the issues identified in Ma ’297.

150. Moreover, using reel 18 attached to slide 14 allows for independent operation of the opening/closing and shade angle adjustment features. In Ma ’763, to change the shade angle, the slide 14 must be fully elevated, which causes the frame and panels 18 to open by tensioning the secondary rope 26. *See* Ex. 1009 at

FIG. 9 (solid line, position of arm 12). Then, the locking device 17 must be activated to pinch the secondary rope 26. Only then can the open canopy be tilted relative to the fully open position, and the tilting can only be in one direction – by lowering the slide 14 from the fully raised position. *See* Ex. 1009 at FIG. 9 (any of the dashed lines positions, all of which are below the solid line position of the arm 12). In Ma '763, this additional step to tilt would be by cranking the crank member 33.

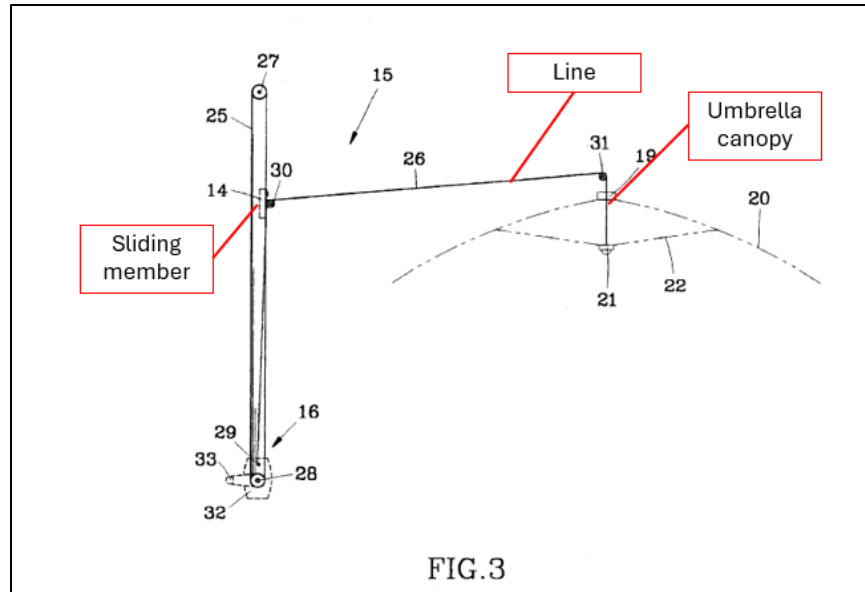
151. Ma '297 explains with regard to U.S. App. 2004/0055628 that “[i]t is however not possible to independently open or close the parasol. Opening of the parasol is only possible having the second tubular element in its fully extended position.” Ex. 1015 at [0003]. Ma '297 states “[i]t is therefore an object of the invention to provide a telescopic parasol stand which is more robust and more reliable and in which the parasol can be operated independently of the position of the second tubular element relative to the first tubular element.” Ex. 1015 at [0005]. Ma '297 elaborates “[a]s the opening or closing of the parasol 15 is fully independent of the position of the second tubular element 13 relative to the first tubular element 12 it is thus possible to place the parasol 15 under an angle.” Ex. 1015 at [0025]. Ma '297 also explains that “[b]y rotating the crank 8 the wheel 6 is operated and the second tubular element 4 can be retracted or extended independently of the position of the parasol 2.” Ex. 1015 at [0020]. Ma '297 also explains that “the

opening or closing of the parasol 15 is fully independent of the position of the second tubular element 13 relative to the first tubular element 12 it is thus possible to place the parasol 15 under an angle.” Ex. 1015 at [0025]. Replacing the locking device 17 of Ma ’763 with the reel 18 of Ma ’297 makes opening and closing of the umbrella canopy of Ma ’763 independent of the position of the slide 14 of Ma ’763.

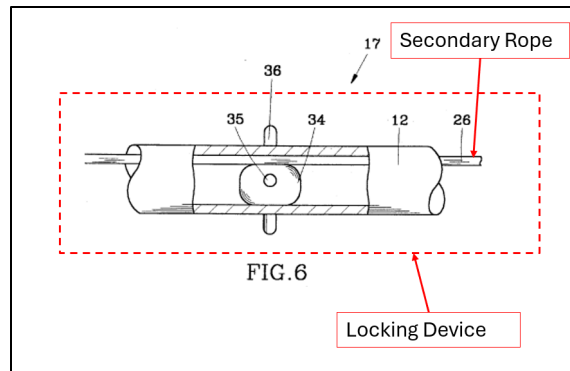
- i. **Claim 1.h: “a line having a first end that winds around the winder hub, an intermediate portion extending from the winder hub along the arm to the umbrella canopy, and a second end that engages the umbrella canopy”**

152. Ma ’763 discloses a line (secondary rope 26) that engages the umbrella canopy. Ex. 1009 at 3:17-10 and Figure 3. Ma ’763 explains that the “remote end of the secondary rope 26 extends through a central bore (not labeled) defined in the crown 19” of the umbrella canopy. Ex. 1009 at 3:2-4 and Figure 3. As shown below, the “arm 12 is an elongate tubular member through which the [intermediate portion of the] secondary rope 26 extends.” Ex. 1009 at 3:49-5.

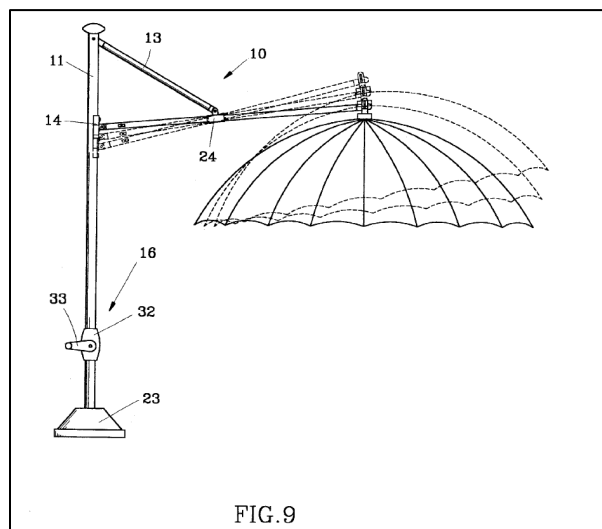
153. While Ma ’763 discloses a mechanism that applies tension to a line (secondary rope 26) that has an intermediate portion extending along the arm (arm 12) that can be attached to a sliding member (slide 14) to engage with the umbrella canopy (panel 18 and crown 19), Ma ’763 does not disclose a winder hub on a sliding member.



154. When a user of the Ma '763 umbrella moves the slide 14 using the crank driving device 16, tension is applied to the secondary rope 26 due to the secondary rope 26's fixed length. For example, Ma '763 discloses that when the slide is driven up towards the upper end of the pole, "the distance between the slide 14 and the pin 29 ... is increased which causes the runner 21 to move toward the crown 19 and thus open the panel 18." Ex. 1009 at 3:58-67 and 4:41-47. As shown in Figure 6, a user then uses locking device 17 to pinch the secondary rope 26 to maintain tension to the umbrella. Ex. 1009 at 4:22-25 and Figure 6. Ma '763 states that a POSITA would understand that the locking device 17 may be located on the sliding member (slide 14). Ex. 1009 at 4:36-40.

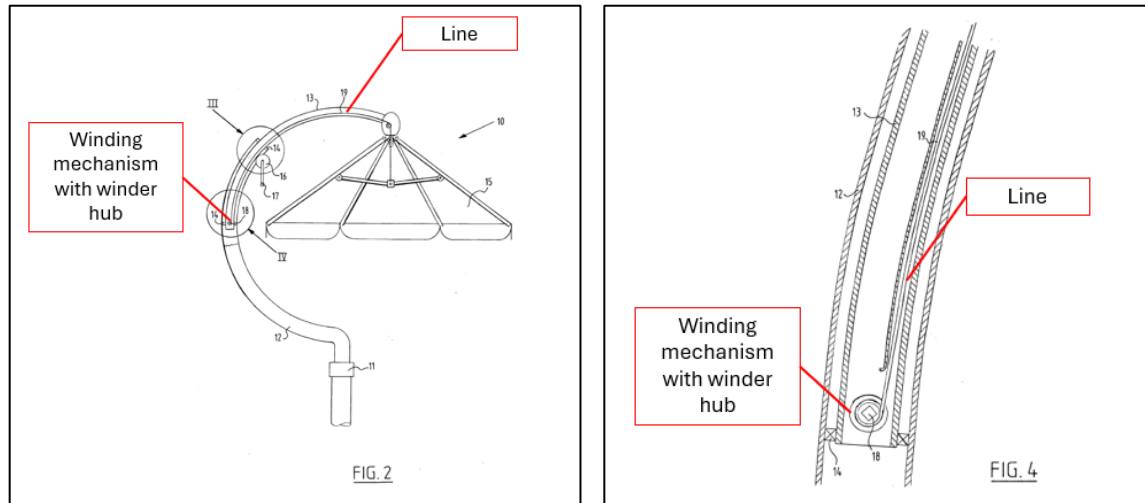


155. A user can then manipulate slide 14 using the crank driving device 16 to perform any subsequent adjustment to the height and angle of the deployed umbrella. Ex. 1009 at 4:15-21 and Figure 9.



156. To the extent, Ma '763 does not disclose a winder hub, Ma '297 discloses this. Ma '297 discloses an umbrella device with a fixed main pole (first tubular element 12), an arm (second tubular element 13) coupled with the fixed pole, and “[i]nside the second tubular element 13[,] a reel 18 is present along which a cord 19 is wound, which is guided through the second tubular element 13 and is

used to open and close the parasol 15.” Ex. 1015 at [0018], [0022], and Figure 2 and 4 (see annotated below). *See id.* at [0024].



157. For similar reasons stated in Section VI.B.1.h (*supra* Section VI.B.1.h), a POSITA would be motivated to combine these references. As modified, the umbrella of Ma ’763 has a line with a first end that winds around the winder hub.

a. Claim 1.i: “wherein rotation of the winder hub tensions or relaxes the line depending upon the direction of rotation of the winder hub”

158. The use of a winder hub to tension or relax the line is well known in the prior art. For example, Ma ’297 discloses a winder hub (reel 18) that tensions or relaxes the line (cord 19) depending upon the direction of rotation of the winder hub (reel 18). Ma ’297 explains that “[a] reel 18 is arranged in the second tubular element 13 and this reel 18 is used to operate the cord 19, which is used to open and close the parasol 15. Preferably the cord 19 is wound at least for one full loop around

the reel 18. The reel 18 can be operated by for example a crank 17, which can be put into the reel 18 through an opening in the first tubular element 12”. Ex. 1015 at [0024].

159. For similar reasons stated in Section VI.B.1.h (*supra* Section VI.B.1.h), a POSITA would be motivated to combine Ma ’297 with Ma ’763.

b. Claim 1.j: “wherein operation of the winding mechanism to apply tension to the line opens and closes the umbrella canopy in response to movement of the line”

160. In Ma ’763, tension in the line (secondary rope 26) opens and closes the umbrella canopy in response to movement of the line. Specifically, Ma ’763 explains that “when the secondary rope 26 is pulled in a direction away from the panel 18, the runner 21 is moved from a lower closed position (FIGS. 2 and 4) to an upper open position (FIGS. 1 and 3) for driving the ribs 20 and the stretchers 22 to open the panel 18” as shown in Figures 1 and 8 below. Ex. 1009 at 3:4-8.

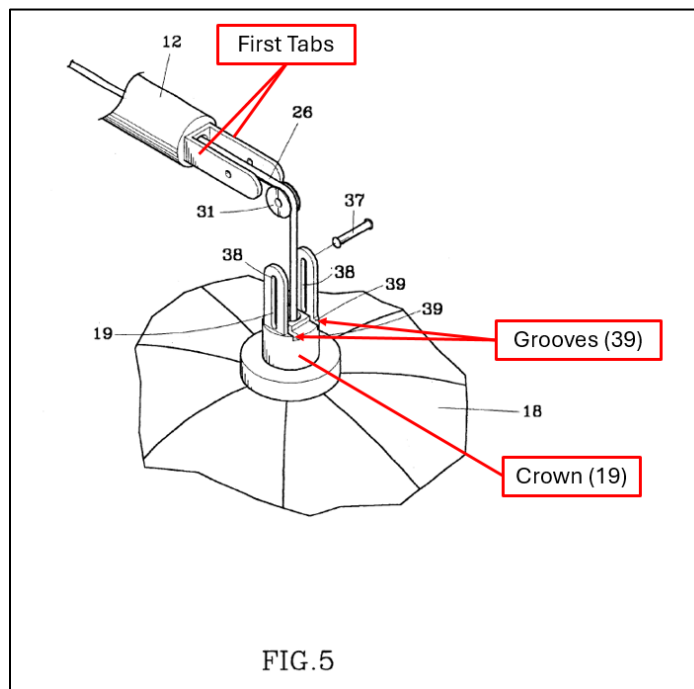
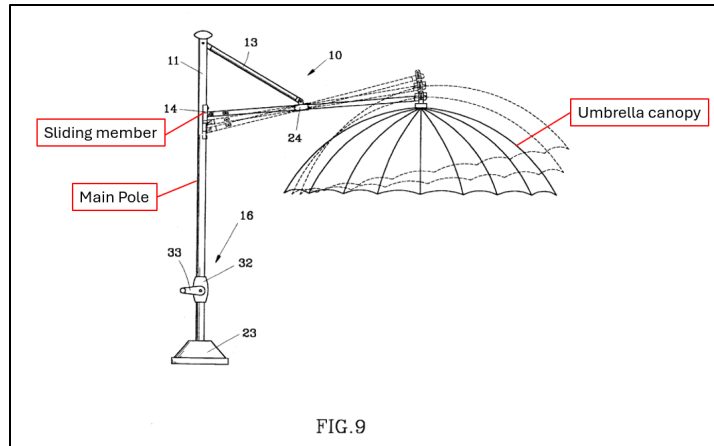
161. Although the umbrella of Ma ’763 does not use a winder hub to anchor the line to the sliding member, the use of a winder hub to tension a line to open and close a canopy was well known in the prior art. For example, Ma ’297 discloses an umbrella device with a fixed main pole (first tubular element 12), an arm (second tubular element 13) coupled with the fixed pole, and “[i]nside the second tubular element 13[,] a reel 18 is present along which a cord 19 is wound, which is guided through the second tubular element 13 and is used to open and close the parasol 15.”

Ex. 1015 at [0018], [0022], and Figure 2 and 4 (see annotated below). *See id.* at [0024].

162. For similar reasons stated in Section VI.B.1.h (*supra* Section VI.B.1.h), a POSITA would be motivated to combine Ma '297 with Ma '763.

c. Claim 1.k: “wherein the angle of the umbrella canopy with respect to the main pole can be controlled by moving the sliding member along the main pole”

163. Ma '763 discloses wherein the angle of the umbrella canopy (panel 18) with respect to the main pole (support pole 11) can be controlled by moving the sliding member (slide 14) along the main pole (support pole 11). As shown in annotated Figure 5, Ma '763 explains that the canopy (panel 18) is securely attached to the arm, thereby allowing the panel or “canopy” to be moved with the arm for adjusting the orientation thereof. Ex. 1009 at Abstract, 4:18-21. Ma '763 discloses that “[s]paced tabs are formed on the arm to be received in grooves defined in the crown when the arm is moved to the open positioned for securely attaching the panel to the arm thereby allowing the panel to moved with the arm for adjusting the orientation thereof.” Ex. 1009 at Abstract, 4:18-21, and Figures 5 and 9 (annotated below).

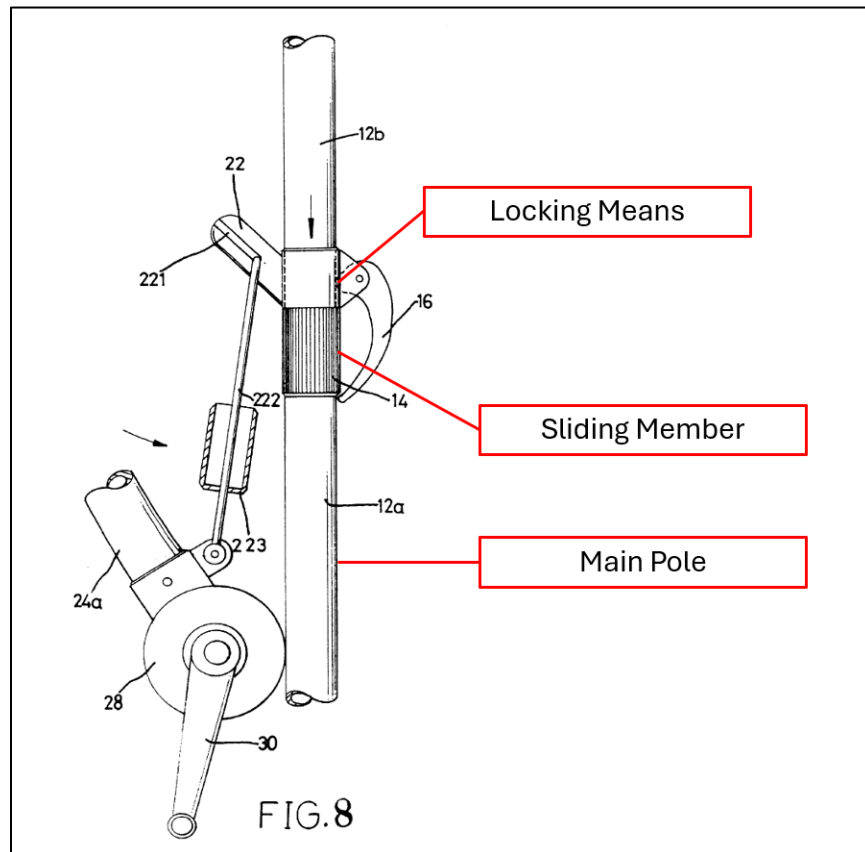
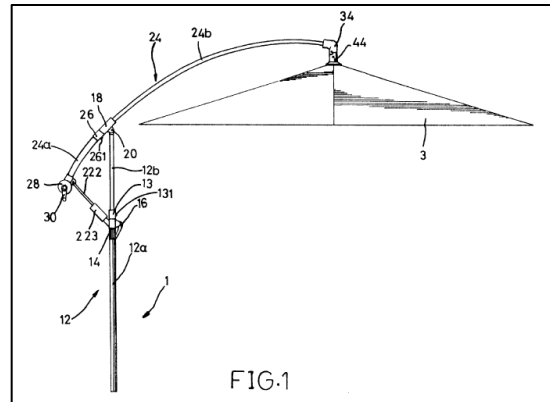


164. Accordingly, Ma '763 in view of Bertola '895 in further view of Ma '297 render claim 1 as obvious under pre-AIA 35 U.S.C. § 103.

2. **Claim 2: “[t]he umbrella of claim 1, wherein the locking means for releasably securing the sliding member to the main pole comprises a cam latch member having a cam surface, the cam latch member being rotatable with respect to the sliding member between a first position in which the cam surface causes the sliding member to be clamped against the main pole, and a second position in which the**

cam surface permits movement of the sliding member with respect to the main pole.”

165. To the extent that claim 2 is not disclosed by Ma '763, Tung '037 discloses a locking means for releasably securing the sliding member (adjusting sleeve 14) to the main pole (supporting rod 12) comprising a cam latch member (lever 16) having a cam surface. Further, the Tung '037 cam latch member is rotatable with respect to the sliding member (adjusting sleeve 14) between a first position in which the cam surface causes the sliding member (adjusting sleeve 14) to be clamped against the main pole (supporting rod 12), and a second position in which the cam surface permits movement of the sliding member (adjusting sleeve 14) with respect to the main pole (supporting rod 12). For example, Tung '037 states “[t]he main frame 1 includes a supporting rod 12, an adjusting sleeve 14 slidably mounted around the supporting rod 12, and a lever 16 mounted to the adjusting sleeve 14. When the lever 16 is in a locked position, the adjusting sleeve 14 is frictionally retained in place, and when the lever 16 is in a released position, sliding movement of the adjusting sleeve 14 relative to the supporting rod 12 is allowed.” Ex. 1010 at 3:36-46. *See id.* at 4:57-63 and Figures 1 and 5-10. Figure 1 and an annotated Figure 8 are reproduced below.



i. Motivation to combine Ma '763 with Tung '037

166. A POSITA would have understood that a simple substitution of the locking mechanism in Ma '763 with the cam latch locking mechanism of Tung '037 would yield predictable results to improve adjusting collapsable umbrella products

and to affix the slide 14 in a selected position. Indeed, Ma '763 and Tung '037 both relate to collapsable umbrella products and are thus in the same industry. Moreover, the examiner for the '640 Non-Provisional Application also cited Tung '037 as prior art and the applicant did not deny it. Ex. 1002 at 93-96 and 106.

167. A POSITA would have understood that this modification would eliminate a pulley and rope device from Ma '763, which would eliminate a source of wear and potential failure. Specifically, in the Ma '763 umbrella, the slide 14 is locked into place by the tension of the primary rope 25 and the presence of double gears 45, 46 holding the slide. Ex. 1009 at 3:12-16, 3:57-67 and 5:22-35. The slide staying in place, and therefore holding the umbrella in place, depends on the integrity of the rope which can be weakened for many reasons, including by degradation and wear of the primary rope 25 operating over the pulley 27. A failure in the integrity of the rope would result in the collapse of the umbrella and could lead to user injury. Moreover, prior art teaches that removing pulleys provides a better design by reducing opportunities for “defects ... caused by the breakage of the cord or jamming of the cord at one of the several pivot areas around which the cord is guided” and by providing a design that “can be operated independently of the position” of other mechanisms. Ex. 1015 at [0004], [0005], [0025].

168. Additionally, in the Ma '763 umbrella, the canopy must be locked in a fully open position before the user can adjust the angle of the canopy through moving

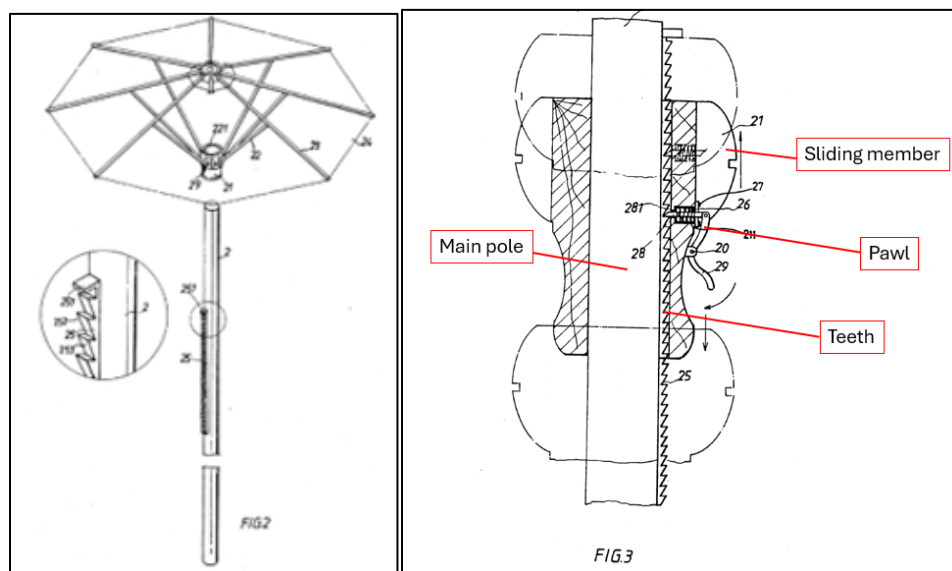
the slide 14 because primary rope 25 has dual functions for (a) opening and closing the canopy and (b) positioning the angle of the canopy. Using the cam latch mechanism described in Tung to lock the slide in place instead of the primary rope 25, would allow a user to adjust the angle of the canopy independently from opening or closing the canopy.

169. Thus, a POSITA would have been motivated to combine the cam latch mechanism taught in Tung with the locking means in Ma '763 to make a device that is simpler and less prone to breakage. A POSITA would understand that using the cam latch mechanism in Tung provides for a more secure and durable locking means than the locking means taught in Ma '763. A POSITA would also understand to use the locking mechanism of Tung to remedy the drawbacks in Ma '763. Thus, Ma '763 in view of Tung '037 renders claim 2 as obvious under pre-AIA 35 U.S.C. § 103.

- 3. Claim 3: “[t]he umbrella of claim 1, wherein the locking means for releasably securing the sliding member to the main pole comprises a plurality of teeth formed on the main pole and a cooperating pawl associated with the sliding member and selectively operative to engage a selected one of the teeth to prevent movement of the sliding member with respect to the main pole.”**

170. To the extent that Ma '763 does not disclose this claim, Liu '171 discloses a sliding member and a locking means that has a plurality of teeth on the main pole and a cooperating pawl shown below in annotated Figure 3. Specifically, the Abstract of Liu '171 discloses a “rack-like member is equipped with a plurality

of consecutive Z-shaped teeth” located on the main shaft of the sunshade where the sliding member can slidably move along the rack. Ex.1011 at Abstract; 2:21-38; 3:1-6. The front tip of the supporting pin located on the runner engages “with the teeth of the rack-like member and can disengaged [*sic*] there with by actuation of the arc arm so as to make the supporting pin retrievably actuated.” Ex.1011 at Abstract. See Ex. 1011 at 1:19-31, 2:21-38, 3:10-30. The movement of the runner allows the user to manipulate the sunshade. Ex. 1011 at 3:31-49. Exemplary Figure 2 and annotated Figure 3 are shown below. See Ex.1011 at Figures 2 and 3.



i. Motivation to combine Ma '763 with Liu '171

171. A POSITA would have understood that a simple substitution of the known locking means in Ma '763 with the locking mechanism in Liu '171 would have yielded predictable results to adjusting collapsable umbrella products and to secure the umbrella into place. Indeed, Liu '171 and Ma '763 both relate to

collapsible umbrella products and are thus in the same industry. Moreover, the examiner for the '640 Non-Provisional Application found that Liu '171 was prior art that taught one how “to modify the locking means ... by using a teeth-and-pawl means as taught by Liu ['171].” Ex. 1002 at 141-142 (June 24, 2010 Non-Final Office Action). The applicant did not respond to the examiner’s characterization that Liu '171 was prior art. *Id.* at 93-96.

172. A POSITA would have understood that this modification would eliminate a pulley and rope device from Ma '763, which would eliminate a source of wear and potential failure. Specifically, in the Ma '763 umbrella, the slide 14 is locked into place by the tension of the primary rope 25 holding the slide. Ex. 1009 at 3:12-16 and 3:57-67. The slide staying in place, and therefore holding the umbrella in place, depends on the integrity of the rope which can be weakened for many reasons, including by degradation and wear of the primary rope 25 operating over the pulley 27. A failure in the integrity of the rope would result in the collapse of the umbrella and could lead to user injury. Moreover, prior art teaches that removing pulleys provides a better design by reducing opportunities for “defects ... caused by the breakage of the cord or jamming of the cord at one of the several pivot areas around which the cord is guided” and by providing a design that “can be operated independently of the position” of other mechanisms. Ex. 1015 at [0004], [0005], [0025].

173. Additionally, in the Ma '763 umbrella, the canopy must be locked in a fully open position before the user can adjust the angle of the canopy through moving the slide 14 because primary rope 25 has dual functions for (a) opening and closing the canopy and (b) positioning the angle of the canopy. Using the teeth and pawl mechanism described in Liu '171 to lock the slide in place instead of the primary rope 25, would allow a user to adjust the angle of the canopy independently from opening or closing the canopy.

174. A POSITA would have understood that a simple substitution of the known locking means in Ma '763 with the known locking means in Liu '171 would yield predictable results to improve adjustable collapsable umbrella products and to secure the umbrella into place.

175. Thus, Ma '763 in view of Liu '171 renders claim 3 as obvious under pre-AIA 35 U.S.C. § 103.

4. Claim 4: “[t]he umbrella of claim 1, wherein the locking means for releasably securing the sliding member to the main pole comprises a plurality of holes formed in the main pole and a pin associated with the sliding member and operative to engage a selected one of the holes.”

To the extent Ma '763 does not teach this, Bertola '895 discloses this limitation as set forth above. Specifically, Bertola discloses that the sleeve has a handle and a latch that is operable by means of a button, “whereby the latch engages

in a hole of the mast or the outer tube for the purpose of axial fixation of the slider on the mast.” Ex. 1013 at 28.

176. A POSITA would have understood that a simple substitution of the locking pin and holes of Bertola ’895 with the locking mechanism of Ma ’763 would yield predictable results of adjusting collapsable umbrella products and securing the umbrella into place. Indeed, Ma ’763 and Bertola ’895 both relate to collapsable umbrella products and are thus in the same industry.

i. Motivation to combine Ma ’763 with Bertola ’895

177. For similar reasons stated in Section VI.B.1.d.i (*supra* Section VI.B.1.d.i), a POSITA would be motivated to combine these references to accomplish the goals stated in both references. Further, the locking mechanism in the Ma ’763 umbrella has disadvantages that could be improved by replacing the locking means with the structure disclosed in Bertola ’895. First, the Ma ’763 locking mechanism relies on the tension of the primary rope 25 to hold the slide in place. Ex. 1009 at 3:12-16 and 3:57-67. Thus, the locking mechanism of Ma ’763 is dependent on the integrity of rope which can be weakened due to degradation or inadvertent over-tensioning of the primary rope 25 resulting in the collapse of the umbrella which can lead to user injury.

178. Second, separating the function of manipulating the umbrella canopy of Ma ’763 from the function of securing the slide 14 provides additional advantages.

Without separating these functions, a user would only be able to lower slide 14 once the umbrella canopy is fully opened. *See* Ex. 1009 at 3:57-4:21, 4:41-52, 4:61-67, Figure 1, Figure 2, and Figure 9. Indeed, Ma '763 states that for the umbrella canopy to fully open, “the slide 14 [needs to be] [] driven by the movement of the primary rope 25 to slide toward the upper end of the pole 11, the distance between the slide 14 and the pin 29 that fixes proximate end of the secondary rope 26 to the pole 11 is increased, which causes the runner 21 to move toward the crown 19 and thus open the panel 18, as shown in FIG. 1.” Ex. 1009 at 4:41-47. In other words, to fully deploy the umbrella, the user must operate the crank member 33 to raise the slide 16 to its highest position. Ex. 1009 at 4:41-47. A user then uses locking device 17 to maintain the tension of the secondary rope 26 to keep the umbrella deployed before lowering the slide 16 to reach a preferred height. Ex. 1009 at 4:22-35 and Figure 6. It was recognized in the prior art that a system such as this that requires a “user [] [to] operate the mechanism for adjusting the height of the canopy twice”, is “troublesome.” Ex. 1010 at 1:16-21.

179. Third, removing the pulley 27 and the pulley 30 in Ma '763 used in the locking mechanism for slide 14 would provide benefits. *See* Ex. 1009 at 3:12-16, 3:57-67, Figure 3. Prior art teaches that removing pulleys provides a better design because it reduces opportunities for “defects ... caused by breakage of the cord or jamming of the cord at one of the several pivot areas around which the cord is

guided” and provides a design that “can be operated independently of the position” of other mechanisms. Ex. 1015 at [0004], [0005], [0025]. Instead, one could use Bertola’s locking mechanism to adjust the height of the slide separately from manipulating the umbrella without introducing a mechanism that is dependent on the integrity of a cord and pulley mechanism. Separating the locking mechanism function from the canopy opening function also allows the pulley 30 to be eliminated as it is not needed when a winder hub is used to tension the rope 26 to open the canopy in the modification of Ma ’763. *See* Ex. 1011 at 1:57-2:11, 2:38-42, 3:50-4:9. Thus, a POSITA would have been motivated to use the locking mechanism of Bertola to improve these weaknesses in the locking means used in Ma ’763.

180. Thus, Ma ’763 in view of Bertola ’895 renders claim 4 as obvious under pre-AIA 35 U.S.C. § 103.

5. Claim 5: “[t]he umbrella of claim 1, wherein the sliding member has a handle associated therewith.”

181. To the extent that Ma ’763 does not disclose this claimed limitation, Bertola ’895 discloses a sliding member (slider 28) that has a handle (handle 48) associated therewith. Ex. 1013 at 28. Specifically, Bertola discloses that the sleeve has a handle and a latch that is operable by means of a button, “whereby the latch engages in a hole of the mast or the outer tube for the purpose of axial fixation of the slider on the mast.” Ex. 1013 at 28.

i. Motivation to combine Ma ’763 with Bertola ’895

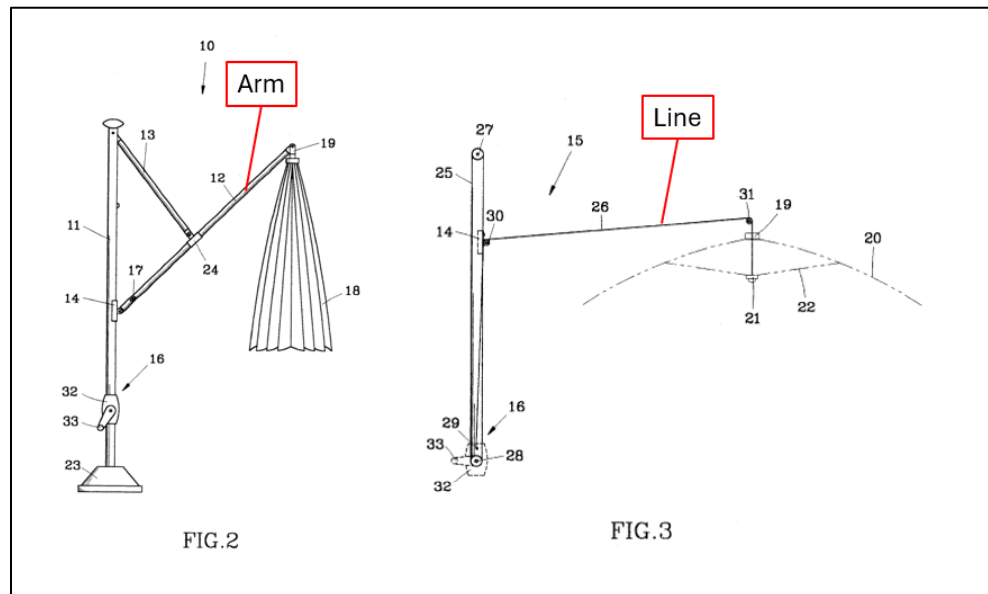
182. Further, as discussed above, a POSITA would have understood the advantages of a simple addition of the handle described in Bertola to the sliding member disclosed in Ma ’763. A POSITA would have understood that adding the handle in Bertola ’895 would yield predictable results to provide an interface for the user to easily manipulate the sliding member. For similar reasons stated in Section VI.B.1.d.i (*supra* Section VI.B.1.d.i), and Section VI.B.4.i (*supra* Section VI.B.4.i) a POSITA would be motivated to combine these references to accomplish the goals stated in both references.

183. Thus, Ma ’763 in view of Bertola ’895 renders claim 5 as obvious under pre-AIA 35 U.S.C. § 103.

6. Claim 6: “[t]he umbrella of claim 1, wherein the line extends along at least substantially the entire length of the arm.”

184. Ma ’763 discloses wherein the line (secondary rope 26) extends along at least substantially the entire length of the arm (arm 12). For example, as shown in Figures 2 and 3 (annotated below), Ma ’763 discloses that “[t]he arm 12 is an elongate tubular member through which the secondary rope 26 extends. The secondary rope 26 further extends through the central bore of the pole 11. In this respect, a pulley 30 is mounted at the proximate end of the arm 12 for aiding the passage of the secondary rope 26 into the pole 11. A further pulley 31 is mounted at

the distal end of the arm 12 for aiding the passage of the secondary rope 26 through the crown 19 to the runner 21.” Ex. 1009 at 3:50-57 and Figures 2 and 3.



185. Thus, Ma '763 renders claim 6 as obvious under pre-AIA 35 U.S.C. §
103.

7. Claim 7: “[t]he umbrella of claim 1, further comprising a crank handle operatively associated with the winder hub, whereby rotating the crank handle causes the winder hub to rotate.”

Ma '763 discloses a crank handle operatively associated with the winder hub, whereby rotating the crank handle causes the winder hub to rotate. Specifically, Ma '763 discloses a crank driving device 16 which “comprises a casing 32 attached to the pole 11 and a crank member 33 extending into the casing 32 with an input gear 44 fixed thereon. Two output gears 45, 46 respectively arranged on upper and lower sides of the input gear 44 and mating with the input gear 44. A predetermined length

of each end of the primary rope 25 is fixed to and wound around a shaft of each output gear 45, 46 whereby when the input gear 44 drives the output gears 45, 46 to rotate in opposite directions, the primary rope 25 may be unwound from one of the output gears 45, 46 and further wound to the other one of the output gear 45, 46 so as to smoothly and continuously move the slide 14 along the pole 11.” Ex. 1009 at 5:22-36. It would have been obvious to a POSITA to attach the known crank member 33 of Ma ’763 to the winder hub of the combination of Ma ’297 and Ma ’763 in order to facilitate a user’s “smooth[] and “continuous[]” winding of the winder hub.

i. Motivation to combine Ma ’763 with Ma ’297

186. For similar reasons stated in Section VI.B.1.h.i (*supra* Section VI.B.1.h.i), a POSITA would be motivated to combine these references to accomplish the goals stated in both references. Accordingly, a POSITA would have understood to combine Ma ’297’s winder hub with Ma ’763’s locking device 17 and crank member 33.

187. Thus, Ma ’763 in view of Ma ’297 renders claim 7 as obvious under pre-AIA 35 U.S.C. § 103.

VII. CONCLUSION

188. Thus, the Challenged Claims are obvious in view of Grounds 1-2 under pre-AIA 35 U.S.C. § 103.

189. In signing below, I recognize that this declaration may be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will cooperate to the best of my ability to appear for cross-examination within the United States during the time allotted for cross-examination.

190. My opinions are held to a reasonable degree of engineering certainty, meaning they rise to the level of at least more likely than not and are based on logical reasoning from the evidence. My opinions are based on the information available to me. If additional information becomes available, I reserve the right to supplement this declaration.

191. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and correct; and further that these statements are made with the knowledge that willful

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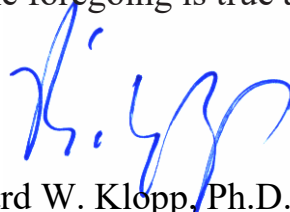
Treasure Garden, Inc. v. ATLeisure, LLC

Klopp Declaration

false statements and the like so made are punishable by fine or imprisonment, or

both, under Section 1001 of Title 18 of the United States Code.

I declare under penalty of perjury that the foregoing is true and correct.



Dated: 9 May 2025

By: Richard W. Klopp, Ph.D., P.E., F.A.S.M.E.