

UMBRELLA DEVICE

Dr. M.Z Khan, Dept. of Physics

Dr. C.V. Raman University, Bilaspur

Abstract

The umbrella device, comprising a body, one rod installed in the body, a handle, wherein the handle rotates in first and second direction for actuating expansion and compression of the telescopic rod, at least one spring mechanism installed in the telescopic rod, wherein the spring mechanism used for assisting expansion and compression of the telescopic rod, at least one frame mounted on the telescopic rod, wherein the frame folds/unfolds upon rotation of the handle, and at least one canopy component attached with the frame.

Keywords: umbrella, handle, telescopic rod, expansion, compression.

1. Introduction

Foldable and collapsible umbrellas are designed to provide shady environment to a person and are available in large sizes. Typically, an umbrella comprises of two supporting tubes, such as an upper and a lower supporting tube and a retractable canopy which is positioned at the top of the pole for providing shades. The upper supporting tube is partially enclosed within the lower supporting tube during closed state and vice-versa. From conventional times, the umbrellas are fabricated to provide shelter to a person in order to protect him/her from climatic conditions, such as rain, heat and snow etc. They basically consists of a handle, a canopy, two rods and a frame structure with multiple ribs arranged in particular manner. The handle further consists of a switch for opening and closing of the umbrellas during the requirement. As the switch based umbrellas are having little bit complex structure, it takes time during opening and closing of the umbrella. Sometimes due to some internal issues the switch based umbrellas are unable to open during their urgent requirement. So as to minimize this problem there is need to develop a rotatable umbrellas which can be easily opened and closed with minor movement of the hands.

2. Experiment

The umbrella device in order to provide an individual with protection in different climate conditions, merely by clockwise and anticlockwise rotating mechanism resulting in opening and closing of the umbrella shade [1]. The body of the umbrella is designed to protect the person against climatic conditions, such as ultraviolet radiations coming from sunlight, rain water and snow [2]. The umbrella is also known as “parasol”. A telescopic rod is installed in the body, wherein the telescopic rod expands and compress. The material used for the telescopic rod is aluminum due to its light weight and high strength characteristics. The spring mechanism is installed inside the telescopic rod of the apparatus for assisting the expansion and compression of the telescopic rod. When the handle of the apparatus is rotated in clockwise direction, then the spring expands in outward direction which leads to the expansion of the telescopic rod, while when the handle is rotated in anti-clockwise direction the spring compresses and the telescopic rod also compresses [3]. The spring component is used for storing energy when the telescopic rod compresses and releasing the stored energy when expanding the telescopic rod thus the release of the energy smoothens the expansion process of the rod [4]. The foldable frame is mounted on the telescopic rod for folding/unfolding of the umbrella. When the telescopic rod expands, the frame unfolds with the expansion of the rod and whenever the telescopic rod is compresses the frame also folds [5]. The frame basically consists of multiple ribs arranged in definite manner so to provide a basic support during opening and closing of the umbrella [2]. The foldable frame is made up of aluminum, steel, brass, nickel and fiberglass so as to keep the umbrella from collapsing during strong wind.

3. Result and Conclusion

The umbrella device is designed to shield the heat, snow and rain droplets away from the person, so as to provide a protective covering to the user(s) while travelling from one place to another. The upper covering of the umbrella is basically made up of the fabric material having waterproof texture, long-lasting nature, and excellent tear resistance and having soft appearance.

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