

A Brief Study of Advancements in Walking Devices

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Abstract - The aim of the paper is to study as well as review the advancements in walking devices. It is desirable to design a walker which would help the user to sit or stand without any external support. The development of walker from traditional walker to smart walker has been studied. In an aging society it is extremely important to develop walker, which can support and aid the glory in their daily life.

1. INTRODUCTION

A walker is a tool for people with disabilities who require extra assistance to maintain balance or flexibility while walking, most often due to physical limitations associated with age. Because of its versatility and rehabilitation ability, walkers take on a significant role. Losing full or part of mobility affects not only the ability to walk, but also the ability to perform personal activities, which is a major determinant of the quality of life and induces dependency in everyday life on others.

The first problem exists in that the frame is made more difficult to move by the rear feet, which must be lifted or dragged. A second problem is that while the walker provides substantial support for the user's body weight, that support must be gained by use of the upper body muscles required to manually grasp and hold the frame. As a result, use of such walkers is generally fatiguing to all major muscle groups. When the user becomes exhausted, no desirable course of action is available. The user simply must advance the walker until a seating area is found.

Another concern for users of such walkers is that one's body is initially lifted to a standing position. The strength needed for such movement is often significantly greater than actually walking, especially where the user may rely on the walker for support. There are however, those who would not be able to use a walker because they lack the strength necessary to lift their body to the position of standing and walking.

Thus the goal of this literature review is to study advancements in walking devices. For the foregoing reasons, there is a need for a walker that can assist in elevation of the user's body, which can provide support to the user without the requirement of upper body strength and also help the user to sit and stand according to his will.

2. LITERATURE REVIEW

The source of data for the literature review were drawn from the available Publication of United States Patent Office, Archives of Physical Medicine and Rehabilitation, Journal

American Geriatrics Society, Journal of Biomechanics. An extensive literature search for published research articles was undertaken using key words from different resources like Google, Digital library and online journals. Articles and information published unpublished information was obtained through internet surfing, snowball technique and other methods. Information was collected from the documents and websites related to agriculture.

3. DISCUSSION

Above research of various authors clearly indicates that the evolution of traditional walkers takes place according to the problems related to supporting the user while walking with various disabilities. Initially two wheeled walkers were invented followed by the four wheeled walkers to remove the difficulty in moving the frame by lifting. Further it focuses on the seat and shoulder support to provide more stability to the user; adding brakes to the rear wheel and folding arrangements and complicated lifting support. In the thorough study of the above literature reviews, we have found some really good inventions which eases the need for walking assistance to the patients. But some of the walkers we have seen have their own design complications, weight issues and stability issues too. Few walkers were able to give the hip support to the patients, but they had very complex mechanisms which are quite difficult to operate. We have seen walkers provided with folding arrangements but with support attachments they are lacking in stability which is not desirable for hip support walkers. In today's world people are more prone towards automation and if we consider the above walkers they lack in automatic features. Hence these types of walkers are generally not used or used in very rare cases. We conclude based on the current evidence, the current walkers has everything except a proper mechanism which can raise or lower the patients according to their need with higher stability. It is desirable to design a walker which is traditional with some automatic attachments to provide hip support. The support mechanism should be easily operable by patients without applying too much effort so that older people and users with less upper strength can use it. Also, the support links should be firm so that the user can sit on it more comfortably. It should be designed in such a way that it has optimal weight and strength with a compact frame.

4. CONCLUSIONS

From the above literature survey we have observed many inventions of traditional walkers which provide walking assistance and hip support while walking. But these walkers have their own complications like compact design, stability issues, etc. Which is likely to be overcome by keeping the eye on today's scenario. For that purpose of modern lightweight lifting mechanisms, automatic equipment should be used. These walkers would be stronger than traditional ones in terms of strength as we use steel and aluminium alloys.

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