FORM 2

The Patent Act 1970

(39 of 1970)

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The Patent Rules, 2005

COMPLETE SPECIFICATION

(SEE SECTION 10 AND RULE 13)

TITLE OF THE INVENTION

"A Smart Audio Assistant for Virtually Impaired using Computer Vision"

APPLICANTS:

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The following complete specification particularly describes and ascertains the nature of this invention and the manner in which it is to be performed: -

Field of the Invention

The technical field of the invention is assistive technologies for disable individuals.

Background of the Invention

The proposed invention addresses a critical issue: the lack of independence faced by visually impaired individuals in their everyday lives. By reducing reliance on others for routine tasks like preparing meals, doing laundry, and navigating unfamiliar environments, this device aims to empower users and enhance their quality of life.

In recent years, several innovations have emerged to assist the visually impaired. For instance, researchers have developed smartphone applications for object recognition, focusing on specific items like traffic signals. While useful, these solutions often have a narrow scope. Our invention takes a broader approach, offering support across a wide range of daily activities and navigation needs.

Other advancements include wearable devices for obstacle detection and navigation assistance. These utilize sensors to alert users to potential hazards, improving mobility. Our invention builds upon this concept, integrating obstacle detection with comprehensive task guidance and object interaction capabilities.

Some existing products, like specialized glasses, can read text and identify faces and products. However, our device goes beyond these functions, providing interactive guidance for complex tasks and assisting with various daily activities.

Smart canes have also been developed, incorporating electronic aids for improved navigation. While beneficial, these focus primarily on mobility. Our wearable solution expands the scope of assistance to encompass a multitude of daily tasks beyond just navigation.

Key features that set our invention apart include:

1. A holistic approach to daily living assistance

2. Step-by-step audio guidance for intricate tasks

3. Adaptive learning to improve performance over the time.

4. Seamless integration of multiple cutting-edge technologies

5. Strong focus on promoting user independence.

6. Environmental awareness for context-specific assistance

7. Customizable functionality to meet individual user needs.

By offering a more comprehensive, adaptable, and interactive solution, our invention has the potential to significantly improve the lives of visually impaired individuals, addressing a wider range of challenges and fostering greater independence.

US20050208457A1 patent discloses a camera-based object detection system for a severely visually impaired or blind person consisting a digital camera mounted on the person's eyeglass or head that takes images on demand. The invention is used to determine the size of an object, or its distance from another object, and can be used in conjunction with an IR-sensitive camera to provide "sight" in poor visibility conditions, or at night.

US9792501B1 patent discloses a device, system, and method of assistance for visually impaired users. The system comprises a plurality of video cameras, often head mounted, computer processors and associated support devices and algorithms configured for computer vision, and a user worn haptic band comprising a plurality (two or more) of distantly spaced haptic transducers.

US-20140184384-A1 patent discloses an assistive device includes a sensor that detects information using a first modality; an actuator that conveys information using a second, different modality; and a controller that automatically receives information from the sensor and operates the actuator to provide a corresponding actuation. A sensory assisting system for a user includes assistive devices and a support the user wears to hold the devices in proximity to body parts.

This groundbreaking invention offers numerous benefits for visually impaired individuals. Its all-encompassing support system tackles a wide array of daily tasks, from navigation to information access, eliminating the need for multiple devices. By empowering users to perform various activities independently, it fosters a sense of self-reliance and autonomy.

Drawings

Fig.1 illustrates the process diagram

Fig.2 illustrates the product

Detailed Description of the Invention

The following description includes the preferred best mode of one embodiment of the present invention. It will be clear from this description of the invention that the invention is not limited to these illustrated embodiments but that the invention also includes a variety of

modifications and embodiments thereto. Therefore, the present description should be seen as illustrative and not limiting. While the invention is susceptible to various modifications and alternative constructions, it should be understood, that there is no intention to limit the invention to the specific form disclosed, but, on the contrary, the invention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention as defined in the claims.

In any embodiment described herein, the open-ended terms "comprising," "comprises," and the like (which are synonymous with "including," "having" and "characterized by") may be replaced by the respective partially closed phrases "consisting essentially of," consists essentially of," and the like or the respective closed phrases "consisting of," "consists of, the like. As used herein, the singular forms "a", "an", and "the" designate both the singular and the plural, unless expressly stated to designate the singular only.

The innovative approach adopted in this invention combines several advanced technologies to create a comprehensive assistive device for visually impaired individuals. The methodology incorporates a sophisticated remote interface that merges hardware and software components to process environmental data and user inputs effectively.

A key feature is the speech-to-text system, which converts vocal commands into digital format, enabling the device to interpret and execute user requests accurately. The environmental scanning capability utilizes a combination of sensors, GPRS, and camera modules to provide robust navigation support and obstacle detection.

The device's computer vision and image processing abilities allow it to recognize objects and assess their orientation, providing context-aware assistance. This is complemented by an integrated software system that processes sensor data and accesses pre-stored instructions to guide users through various tasks.

By incorporating an online virtual assistant, the device extends its capabilities, offering access to a wide range of digital services. The deep learning model at its core continuously analyzes user patterns, adapting and improving its performance over time. This is further enhanced by synchronized audio guidance, which provides step-by-step instructions based on the user's environment and actions.

While specific measured outcomes are not provided, the expected results of this invention are promising. Users are likely to experience increased independence in daily activities and

improved navigation skills. The device aims to enhance task performance across a variety of complex activities, from cooking to using ATMs.

Object and person identification capabilities could significantly improve users' interactions with their surroundings. The invention also seeks to bridge the digital divide by assisting with smartphone use and internet access, opening up new possibilities for research, social interaction, and online shopping.

Continual learning and adaptation are central to the device's functionality, allowing it to evolve with the user's needs and habits. Enhanced obstacle avoidance and easy access to information further contribute to the user's safety and knowledge.

Perhaps most importantly, the psychological benefits could be substantial. By promoting independence and enabling users to engage in a wider range of activities, the device has the potential to boost confidence and overall quality of life.

The versatility of the invention is a standout feature, offering assistance across numerous daily tasks through a single, integrated device. This comprehensive approach, combined with its ability to provide personalized experiences, positions the invention as a potentially transformative tool in assistive technology for visually impaired individuals.

This innovative device stands out with its array of cutting-edge features designed to support visually impaired individuals. At its core, it functions as an intelligent virtual assistant, offering vocal guidance across a spectrum of daily activities. By harnessing advanced computer vision, the device excels in recognizing objects, scanning surroundings, and aiding navigation.

The invention's network of IoT sensors, including ultrasonic and infrared, enhances its ability to detect obstacles and assess the environment. Its speech-to-text capability ensures accurate interpretation of user commands, while a sophisticated deep-learning model continually refines its performance by analyzing usage patterns.

Users benefit from a multi-faceted feedback system, receiving both audio guidance and cautionary alerts. The device's integration with online services expands its utility, offering access to research tools, entertainment, and information resources. Its compact, wearable design makes it ideal for daily use.

What truly sets this invention apart is its comprehensive approach. Unlike specialized tools, it unifies navigation assistance, object identification, task guidance, and information access in

one device. It goes beyond basic recognition, offering interactive, step-by-step instructions for complex activities.

The system's contextual awareness is remarkable, understanding the user's environment to provide relevant help, whether it's navigating a kitchen or using an ATM. Its ability to learn and expand its capabilities based on user input makes it highly adaptable to individual needs.

This device is unique in its focus on fostering independence, addressing a broader range of daily challenges than existing solutions. It seamlessly integrates various technologies into a user-friendly interface and offers proactive assistance, warning users of potential hazards.

The invention's personalized learning feature allows it to adapt to user habits over time, providing increasingly tailored support. Its versatility is unparalleled, assisting with tasks ranging from basic navigation to complex activities like cooking.

Moreover, the device plays a crucial role in bridging the digital divide, helping visually impaired users engage more effectively with modern technology, including smartphones and internet services.

In essence, this invention's distinctiveness lies in its holistic, adaptable approach to assistance. By combining multiple advanced technologies in a single wearable device, it has the potential to significantly enhance the independence and quality of life for visually impaired individuals.

This groundbreaking invention offers numerous benefits for visually impaired individuals. Its all-encompassing support system tackles a wide array of daily tasks, from navigation to information access, eliminating the need for multiple devices. By empowering users to perform various activities independently, it fosters a sense of self-reliance and autonomy.

The device's adaptability is a key strength. Utilizing advanced deep learning, it continuously refines its performance based on user habits and interactions. This multifaceted tool integrates obstacle detection, object identification, text interpretation, and task guidance into a single wearable unit, significantly enhancing users' daily capabilities.

Perhaps most importantly, the invention has the potential to dramatically improve quality of life. By facilitating independent cooking, ATM use, and navigation, it can boost users' confidence and self-esteem considerably.

From a technical standpoint, the device represents several innovative breakthroughs. It seamlessly merges computer vision, IoT sensors, speech recognition, and virtual assistant

features in a compact, wearable design. Its contextual awareness allows it to interpret complex environments and provide tailored assistance for specific tasks.

Unlike basic recognition systems, this invention offers interactive, step-by-step audio guidance for intricate tasks. Its adaptive learning algorithm, which evolves based on daily use, marks a significant advancement in wearable assistive technology. The real-time processing of visual data, obstacle detection, and audio feedback is equally impressive.

The device's versatility may surprise many, as it can assist with an unexpectedly wide range of tasks. Its ability to learn and incorporate new functions based on user input could lead to highly personalized assistance. The social impact could be substantial, potentially leading to improved interpersonal interactions and overall life satisfaction for users.

From a cost perspective, this all-in-one solution could prove more economical than purchasing multiple specialized devices. The increased independence it provides might reduce care-related expenses for visually impaired individuals. As a software-driven device, it offers scalability, with the potential for updates and new features over time.

If widely adopted, mass production could make the device more affordable than existing assistive technologies. Moreover, by promoting independent living, it could potentially lower healthcare costs associated with accidents or mental health issues stemming from lack of autonomy.

In conclusion, this invention represents a potential game-changer in assistive technology for the visually impaired, offering a comprehensive solution that surpasses the capabilities of current market offerings.

We Claim

1. A smart audio assistant device for virtually impaired, comprises:

- Speech-to-text system- converts vocal commands into digital format;
- Network of IoT sensors, including ultrasonic and infrared, enhances its ability to detect obstacles and assess the environment;
- GPRS, and camera modules to provide robust navigation support and obstacle detection;
- Computer vision and image processing abilities to recognize objects and assess their orientation, providing context-aware assistance;
- an integrated software system that processes sensor data and accesses pre-stored instructions to guide users through various tasks;
- an online virtual assistant; and
- deep learning model for continuously analyzes user patterns, adapting and improving its performance over time.

2. The smart audio assistant device for virtually impaired as claimed in the claim 1,wherein device object and person identification capabilities could significantly improve users' interactions with their surroundings.

3. The smart audio assistant device for virtually impaired as claimed in the claim 1,wherein device has the potential to dramatically improve quality of life, by facilitating independent cooking, ATM use, and navigation, it can boost users' confidence and self-esteem considerably.

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