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Before We Get Started



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Recording

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Otto IP Team



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Business Development Director



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Support Specialist

BLACKHILLS AI

Black Hills AI was founded over 14 years ago by IP professionals.

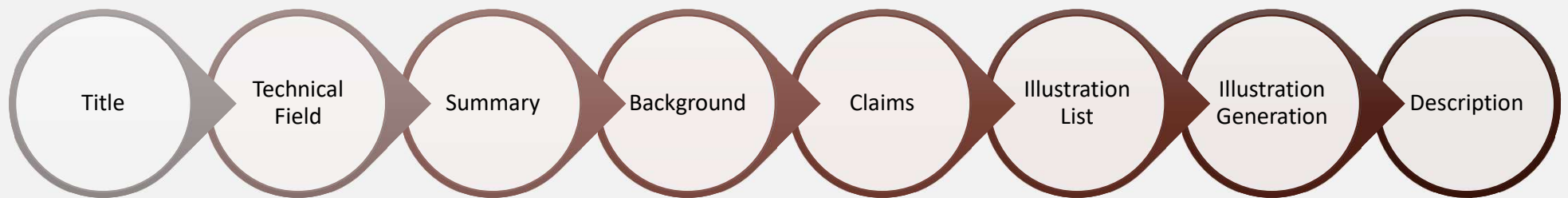
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- End-to-End Automation Services:
 - Processing Correspondence
 - Docketing & Docket Verification
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- Patent renewals management

Guided Skills

Drafting

Guided Skills – Patent Application Draft



Guided Skills – Title, Field, Summary

- Title
- Field of the Invention
- Summary



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December 1, 2025

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reading_glasses_drawings_Dec_1_2025_10_00_28_AM.png

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Message

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Search

Summary of the Invention.docx

Patent Summary Generation

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Patent App.docx

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ChatAI • Sonnet-4.5

Conversational

Text-based AI chat

ImgGen • GPT-image-1

Image Generation

AI image generation

ImgAnalysis • Sonnet-4.5

Image Analysis

AI image analysis

DiagGen • EraserIO

Diagram Generation

Generate Diagrams/Flow Charts

Guided Skill

Launch a Guided Skill

Specialized AI assistants

Summary of the Invention

The present invention provides a system and method for illuminating reading material based on real-time detection of the wearer's gaze direction and environmental lighting conditions. The system includes a pair of eyeglass frames having bilateral LED arrays positioned within the temple portions, with each array configured to project focused illumination toward reading material positioned in front of the wearer. Eye-tracking sensors mounted on the frame continuously monitor gaze direction and focal distance, generating control signals that direct the illumination to follow the user's point of visual attention. Optical elements including collimating lenses or reflectors shape the LED output into controlled beams that converge on the reading area, providing uniform illumination that dynamically repositions as the user's eyes move across the material.

In one embodiment, the invention comprises a pair of eyeglass frames having bilateral LED arrays positioned within the temple portions, with each array configured to project focused illumination toward reading material positioned in front of the wearer. Eye-tracking sensors mounted on the frame continuously monitor gaze direction and focal distance, generating control signals that direct the illumination to follow the user's point of visual attention. Optical elements including collimating lenses or reflectors shape the LED output into controlled beams that converge on the reading area, providing uniform illumination that dynamically repositions as the user's eyes move across the material.

The adaptive control system processes inputs from multiple sensors including the eye-tracking components, ambient light sensors, and optional inertial measurement units to optimize illumination parameters in real-time. The system automatically adjusts LED brightness based on detected ambient illumination levels, modulates color temperature according to time-of-day circadian principles, and fine-tunes beam focus based on estimated reading distance derived from binocular eye vergence. A microprocessor executing control algorithms coordinates these adjustments at update rates sufficient to provide imperceptible response to eye movements, typically 60-120 Hz for eye tracking with smoothed control updates at 20-30 Hz.

Advanced embodiments incorporate machine learning algorithms that develop personalized lighting profiles by monitoring user behavior and manual adjustments over time. The system stores user preferences for different contexts—such as time of day, ambient lighting conditions, and reading material characteristics—in non-volatile memory.

Total Attachments : 3

A/N home : 3 files

Guided Skill - Patent Summary Generation

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Guided Skills – Claims



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🔍 Search

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Summary of the Invention.docx

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Guided Skill - Patent

Reading and close visual tasks require adequate illumination to ensure visual comfort, reduce eye strain, and maintain performance. Traditional solutions include fixed position lamps, portable clip-on book lights, head-mounted illumination devices, and more recently, illuminated eyewear with integrated LEDs. While each approach offers certain advantages, all suffer from significant limitations. Fixed lighting is inherently stationary and unsuitable for mobile reading scenarios. Clip-on lights must be physically repositioned as reading material changes and provide static illumination even as the reader's eyes move across pages. Headlamps, though hands-free, are socially awkward in many settings, produce beams designed for distance rather than close reading, and create unnatural lighting angles that cause glare. Current illuminated eyewear products integrate small LEDs into eyeglass frames but provide only fixed-angle, non-adaptive illumination that fails to account for the dynamic nature of reading where eyes constantly move and environmental conditions change.

These existing solutions share a fundamental limitation: they treat illumination as a static property rather than a dynamic parameter that should adapt to changing conditions and user needs. None provide real-time adaptive illumination that responds to gaze direction, ambient lighting conditions, or circadian-appropriate color temperature simultaneously. Current illuminated eyewear cannot detect where the user is looking, cannot adjust beam direction to follow eye movement, cannot sense ambient light to optimize brightness output, and cannot shift color temperature based on time of day—leading to uneven illumination, wasted battery power, visual discomfort, and potential disruption of circadian rhythms from inappropriate evening light exposure.

The development of truly adaptive, intelligent reading light systems integrated into wearable devices faces substantial technical challenges across multiple engineering disciplines. Miniaturizing eye-tracking technology to fit within eyewear form factors while maintaining accuracy requires sophisticated sensing and careful component placement. Real-time optical control demands either mechanically adjustable elements (adding weight, complexity, and power consumption) or electronically steerable light arrays with sophisticated control algorithms. Integrating illumination, sensing, power storage, and control electronics within the severe space constraints of eyeglass temples (approximately 130-140mm long and 8-10mm thick) while maintaining comfortable weight distribution presents significant engineering obstacles. Power management is particularly challenging given the competing demands of high-brightness illumination, continuous sensor operation, and multi-hour battery life. Additionally, creating optimal beam patterns with miniature optics, processing multiple sensor inputs for environmental adaptation, and accommodating individual facial geometry variations all require complex solutions that have prevented prior art from achieving effective integration.

There exists a substantial unmet need for a reading illumination system that combines the portability and hands-free operation of wearable devices with intelligent, adaptive control responding to multiple parameters in real-time. Such a system would ideally provide illumination that follows the user's gaze automatically, adjusts intensity and color temperature based on ambient conditions and time of day, maintains comfortable ergonomic characteristics for extended wear, operates efficiently to maximize battery life, and requires minimal user intervention while allowing manual customization. What is needed is an innovative integration of sensing, control, optical, and power management technologies specifically optimized for the unique requirements of reading illumination in a wearable form factor.

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View Reasoning

Total Attachments : 2

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Guided Skill - Patent Background of the Invention Generation

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Guided Skills – Figures

- Illustration List
- Figure Generation



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Chat on D...

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Conversational

Text-based AI chat

Image Generation

AI image generation

Image Analysis

AI image analysis

Diagram Generation

Generate Diagrams/Flow Charts

Launch a Guided Skill

Specialized AI assistants

Strategic Claim C

The 20-claim set provides:

2 independent claims

18 dependent claims

Broad-to-narrow claim

Coverage of both hard

Protection for key diff

for temperature control, machine learning)

Areas Requiring Attorney Review:

1. Specific claim scope relative to prior art in illuminated eyewear

2. Appropriate level of detail for optical elements

3. Eye-tracking claim language to ensure coverage of various sensing technologies

4. Machine learning claim limitations to ensure patentability

5. Functional vs. structural claim balance for 35 U.S.C. § 112 compliance

IMPORTANT: These claims are draft versions based on the invention disclosure and interview materials. They must be reviewed, refined, and validated by a qualified patent attorney before filing. A comprehensive prior art search should be conducted to ensure appropriate claim scope and differentiation from existing patents.

File Name: System_Claims_Gaze_Responsive_Reading_Glasses_20_Claims_Dec_1_2025.docx

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Guided Skill - Patent Claims Generation

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Guided Skill - Patent

Guided Skills – Description



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Guided Skill - Patent

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December 1, 2025

Ask Otto- Chat on Dec 10, 2025, 10:29 AM

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This patent illustration includes:

Key Features:

1. Complete perspective view showing the glasses worn on a user's head

2. All structural components clearly labeled with proper reference numbers:

- Frame assembly (100)
- Lens frame portion (110)
- Temple portions (120, 130)
- LED arrays shown in phantom/dashed lines (140, 150)
- Eye-tracking sensors (160, 165)
- Ambient light sensor (170)

3. Functional elements:

- Light beams (190, 195) projecting from temples to reading material
- Reading material (180) with illuminated area (185)

4. Patent drawing conventions:

- Clean black and white line art
- Phantom lines (dashed) for internal components
- Clear leader lines connecting reference numbers to components
- Professional labeling and spacing
- Legend explaining drawing conventions
- Proper figure title and number

The illustration effectively communicates the spatial relationships of all major subsystems and demonstrates the integrated wearable form factor that distinguishes this invention from prior art.

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Guided Skill - Patent Illustration Generation

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Guided Skills – Further Steps

- Work through Figures to build out description
- Add alternative embodiments
- Work through additional claim strategy (continuation prep)
- Abstract
- Compile
- Review

Questions?

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