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(71)Name of Applicant :

1)GD Goenka University

Address of Applicant :Sohna Gurugram Road, Sohna, Haryana, India, 122103 Gurugram -----

Name of Applicant : NA

Address of Applicant : NA

(72)Name of Inventor :

1)Roshni Sengupta

Address of Applicant :Department of Optometry, School of Medical and Allied sciences, GD Goenka University Gurugram -----

2)Jyoti Gangta

Address of Applicant :Department of Optometry, School of Medical and Allied sciences, GD Goenka University Gurugram -----

3)Krishna Kumar Gupta

Address of Applicant :Department of Optometry, School of Healthcare and Allied sciences, GD Goenka University Gurugram -----

(57) Abstract :

The present invention relates to a novel binocular vision diagnostic device designed to enhance the assessment and diagnosis of binocular vision anomalies, such as phorias, small-angle tropias, and diplopia. The device features a trial frame made from lightweight, durable materials, with adjustable dimensions to fit various head sizes. It incorporates prism holders that can hold up to 10 prisms per eye, with a micromotor-controlled rotation mechanism allowing for precise adjustment of prisms along different axes. The device is further enhanced with integrated accessory lenses, including red and green filters for red-green dissociation tests and a Maddox rod for diagnosing heterophoria. An occluder lens is also included for performing cover tests. The system is powered by a rechargeable battery and controlled remotely via a user-friendly mobile application through Bluetooth or Wi-Fi connectivity, enabling seamless adjustment of prisms, lens selection, and test functions. Additionally, the device includes real-time feedback sensors, improving diagnostic accuracy and streamlining the process for optometrists. This invention significantly improves the efficiency, accuracy, and ease of binocular vision assessments.

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