

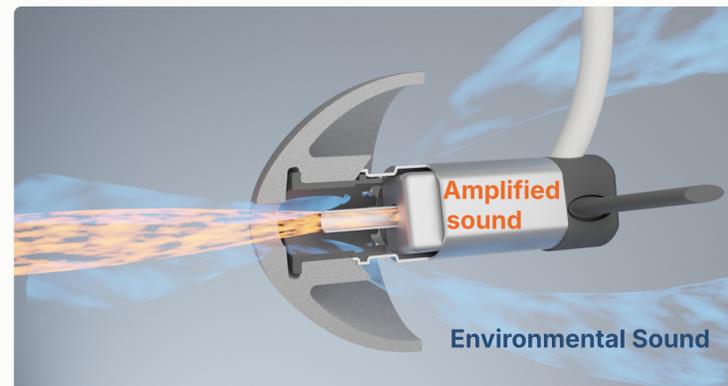
Adaptive Venting in Hearing Aids

Design of a Manual-Driven Receiver-in-Canal Venting Mechanism - *Fugai*

Today's modern hearing aids selectively amplify specific frequencies, improving speech intelligibility. In addition, they suppress background noise and enable phone calls and music streaming via Bluetooth connectivity with smartphones.

Despite these advancements, a trade-off remains between wearing comfort and acoustic performance. Soft, open domes reduce the occlusion effect, improving wearing comfort and natural sound, but allow low-frequency leakage, which reduces bass response when streaming music and impacts speech intelligibility in noisy environments. On the other hand, closed domes enhance low-frequency amplification and noise control, but often cause discomfort due to occlusion.

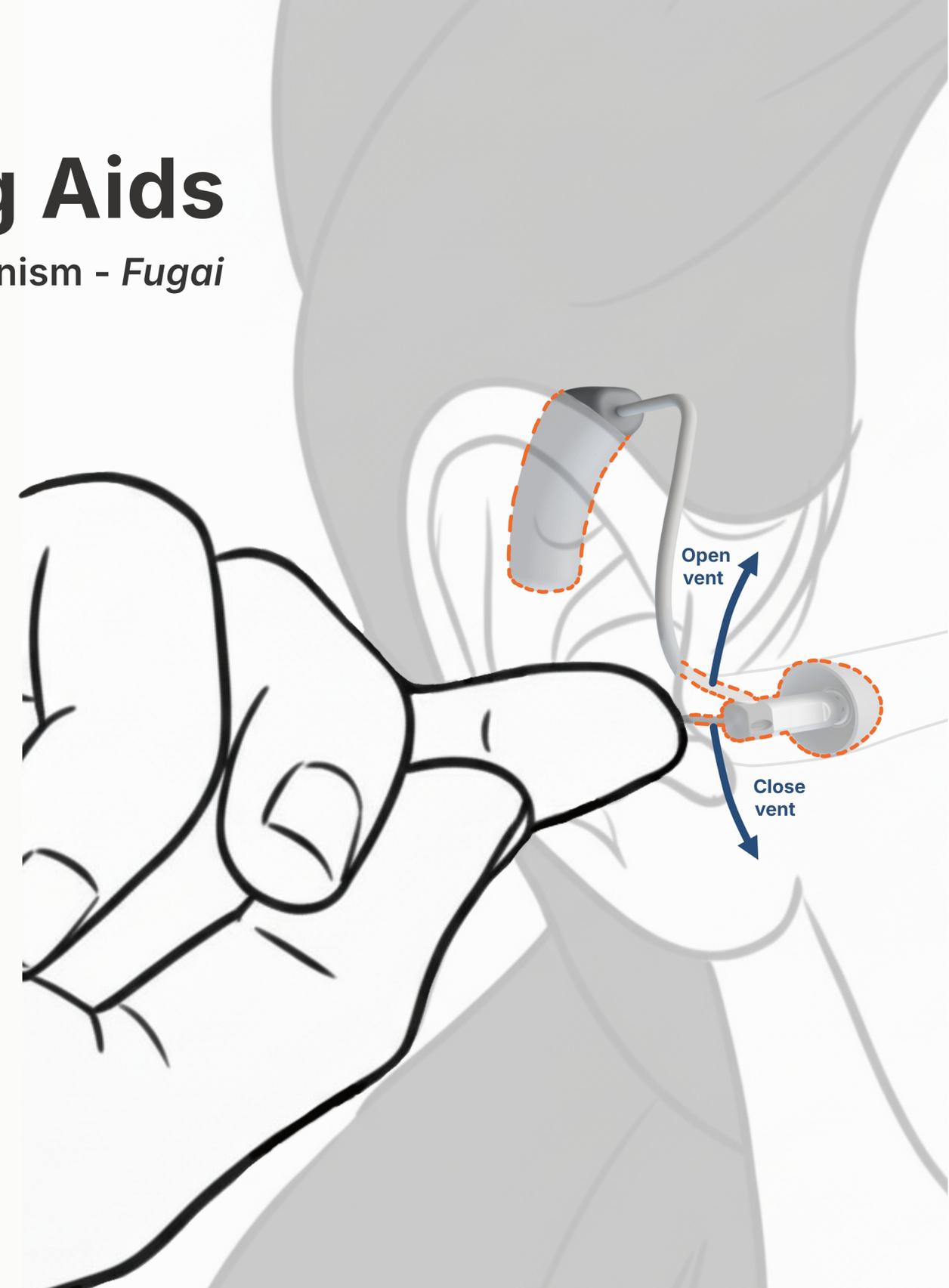
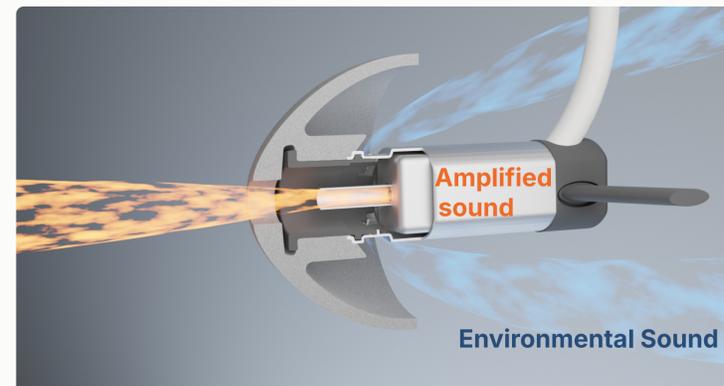
Open vent position - Environmental sounds can pass through



The only commercially available product that addresses this problem automatically switches between open and closed vent states. However, its miniature electronic components reduce cost-effectiveness and durability, while the automated system limits user control.

Fugai is a Receiver-in-Canal hearing aid design concept with a manual adaptive venting mechanism that allows users to control their listening experience across environments. By replacing automation with a manual mechanism, the design improves robustness, durability and cost-efficiency, while enhancing user autonomy and usability.

Closed vent position - Blocking environmental sounds



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