



East West  
design • manufacturing • distribution

# Design Services Case Study

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Designing and Manufacturing a High-Performance, Responsive Smart Fan to Create the Ultimate Indoor Cycling Experience

## ABOUT WAHOO

Located in Atlanta, Georgia, Wahoo Fitness has created a full ecosystem of sensors and devices for the runner, cyclist or general fitness enthusiast. Wahoo Fitness's award-winning line of Bluetooth Smart products include indoor bike trainers, the world's first smartphone connected bike computers, and a family of chest-based wearables that combines heart rate training with advanced motion analytics.

## ABOUT MAVEN

Maven is a strategic design group that collaborates with leading companies to create new products and experiences that delight users, strengthen brands, and improve market share. Based in Atlanta, Georgia, their expertise in connecting tangible experiences has helped leading companies such as Coca-Cola, American Express and AT&T.



“The Wahoo KICKR Headwind was developed in record time through seamless collaboration between design and engineering teams at Maven and East West.”

— Justin Arsenault  
Partner and Lead Designer, Maven

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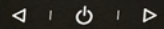
**Cover:** Image courtesy of Maven Design

**Right:** Headwind seamlessly integrates with other products in Wahoo's ecosystem. Photo © Wahoo Fitness





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## The First Purpose-Built Smart Fan

Targeted to indoor cyclists, Headwind automatically adjusts to the way you ride by pairing with speed sensors and heart rate monitors. As your speed or heart rate increases, so will the fan speed. Delivering a realistic headwind up to 30 miles per hour, Headwind simulates the airflow a cyclist feels when riding on the road.

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**Below:** Headwind responds to the intensity of your workout to provide optimized cooling. Photo © Maven



## Ride Like the Wind

Headwind started as an idea from Chip Hawkins, Founder and CEO of Wahoo Fitness. Looking to have this fan integrate seamlessly with other products in their lineup, Wahoo wanted the airflow pattern to mirror the shape and position of a cyclist's body while riding on a bicycle. After working with a local industrial design firm, Maven, on other products in their lineup, Wahoo needed another partner to help with the mechanical design portion and bring this product idea to life through manufacturing.

### Challenges

- Design Resources
- Engineering Support
- Speed to market
- Expertise in fans, motors and airflow analysis
- Consistent look and feel with Wahoo's other products

**Left:** Depiction of the airflow from the Headwind fan on a cyclist. Photo © Wahoo Fitness



## Solutions Provided

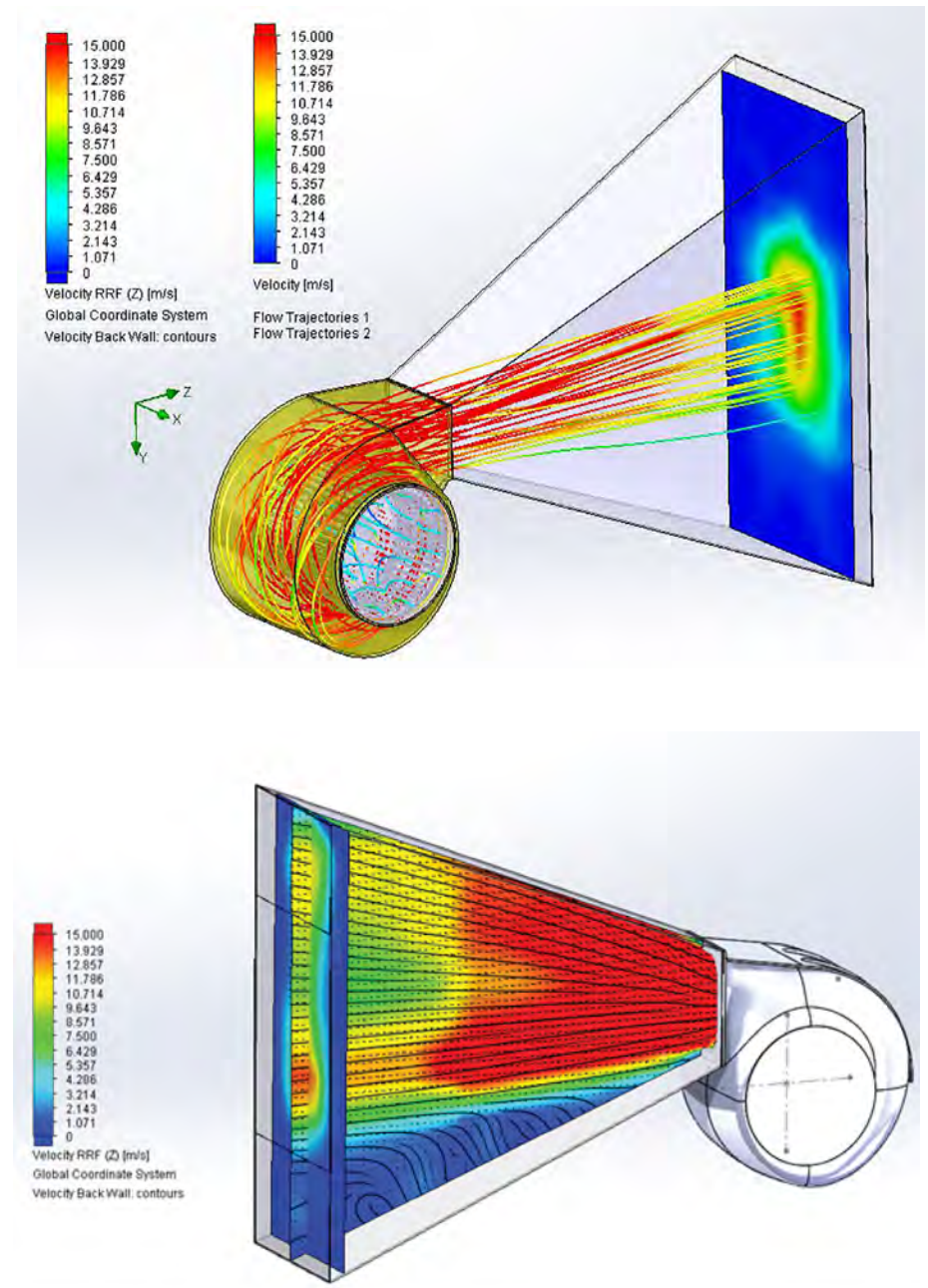
- Computational Fluid Dynamics Analysis
- Industrial Design provided by Maven
- Mechanical Design provided by East West
- Plastic Injection Molding
- Streamlined transition from design to manufacturing

## How East West Helped

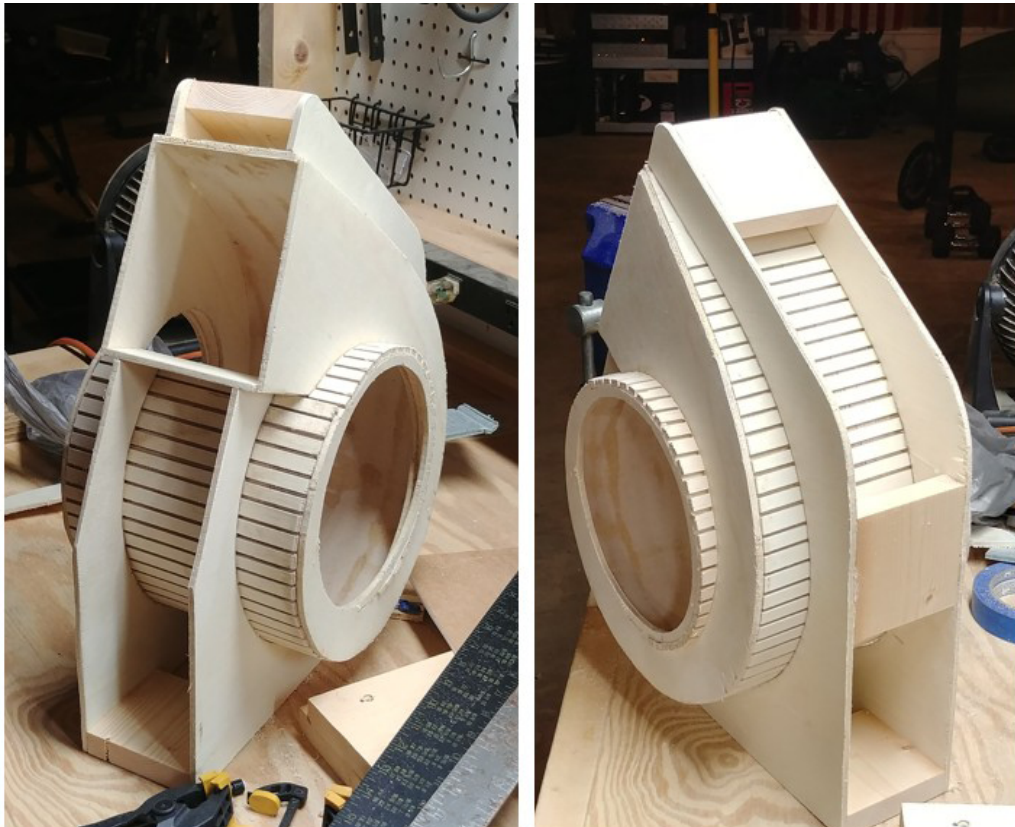
Without the internal design and engineering resources to develop Headwind and build out their fitness platform, Wahoo turned to East West to make this idea a reality.

East West's first task was to establish what type of airflow pattern Wahoo wanted for the fan. Once Wahoo decided on the motor size for Headwind, East West sourced the blower wheel and began Computational Fluid Dynamics (CFD) simulations and analysis to define the internal geometry and airflow.

The airflow design goals included optimizing the airflow to achieve the desired profile, maximizing the airflow velocity over the profile and maintaining a low sound output. In addition to configuring the optimal airflow for Headwind, East West also assisted with the circuit design and wire routing, leveraging Wahoo's approved wireless modules.



**Right:** Results of Computational Fluid Dynamics simulations performed by East West for Headwind.



After the CFD Analysis was complete, East West sent the detailed airflow reports to Wahoo and Maven to begin the ideation process for the look and feel of Headwind.

Maven led the development of the Industrial Design, ensuring the product would complement the other fitness products in Wahoo's offering. Maven's lead designer and East West's senior mechanical design engineer collaborated closely to ensure the design would be easily moldable for tooling and ultimately manufacturable.

Maven provided visuals of the exterior design to East West, then East West's design engineers would mock up the proposed concept and make recommendations on what would work best for manufacturing.

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**Above:** Sketches of the Headwind fan design by Maven.

**Left:** A wooden mock up of Headwind constructed by East West's senior mechanical design engineer.



The East West Design team also sought feedback on the suggested models from their own factory in Vietnam, which would ultimately end up manufacturing the product. Once Headwind's design was finalized, CNC machined prototypes were created to test out the product.

By leveraging expertise between Maven, East West Design Services and East West's Vietnam factory during the design and tooling process, Wahoo benefited from a constant loop of feedback between the three companies and Headwind's path to mass production was seamless.

## Looking Ahead

Headwind was successfully launched in time for Wahoo's mid-year product unveiling, along with the new KICKR and KICKR CORE, and has received rave reviews from cycling fanatics and professionals alike.

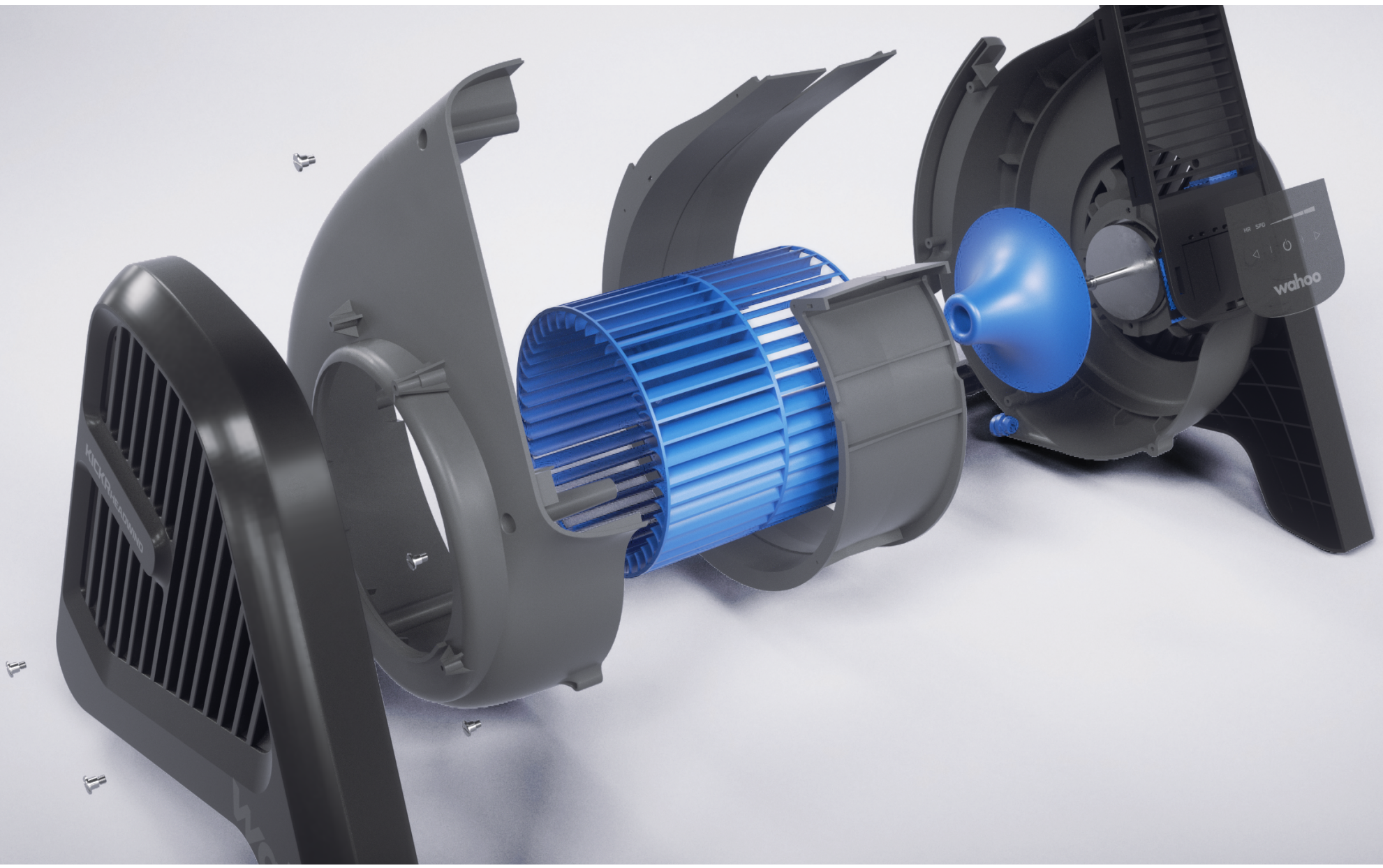
East West and Wahoo are currently collaborating on additional fitness products to create the ultimate training experience for everyone from cycling enthusiasts to professional athletes.

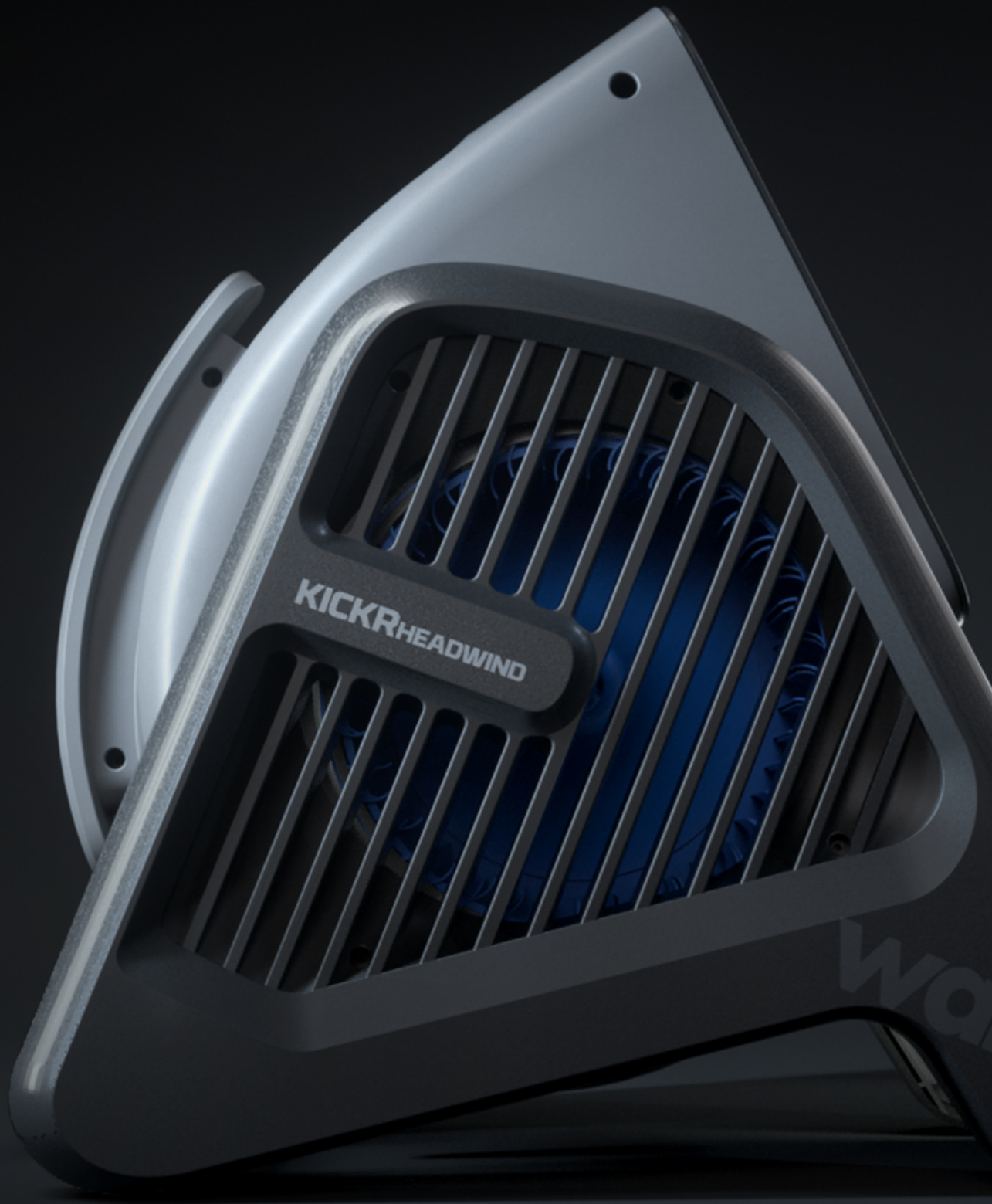
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**Left:** Bluetooth capabilities allow Headwind to connect to Wahoo's heart rate monitors and speed sensors. Photo © Maven

**Next Page:** A deconstructed view of Headwind. Photo © Maven







**KICKR**HEADWIND

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“Our product road map was in jeopardy of getting backlogged. We needed a design partner that understood the direction of where Wahoo is heading. Our internal resources were at max capacity. Partnering with East West gave us access to Designers who are Manufacturers, and that gave us the speed to market that we needed. We had a tight deadline and finding a team with fan and motor design experience was pivotal in getting Headwind into the hands of the customers as quickly as we wanted. The market reaction to the Headwind launch has been fantastic.”

— Chip Hawkins  
CEO and Founder of  
Wahoo Fitness



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