THE BIRDLIKE WINGS FOR HUMANS: A WEARABLE FLAPPING WING SYSTEM FOR HUMAN FLIGHT

Date of Public Disclosure: June 8, 2025 rev. June 11, 2025

Abstract

This disclosure describes a novel design for a wearable flapping wing system capable of lifting the full weight of a human wearer, enabling personal flight. The system integrates existing advanced lightweight materials, bio-inspired wing mechanics, and emerging actuators such as electroactive polymers (EAPs). This design addresses the complex challenges of human-scale lift, power, and control, proposing a feasible pathway towards personal, wearable flight technology.

Josef David
inventor@saved.cz

1. Introduction

Personal flight has long been a dream of humankind. While fixed-wing devices like hang gliders and wingsuits provide limited flight capabilities, their reliance on forward speed and large wing surfaces restricts usability and portability. This invention proposes a wearable wing system that actively flaps to generate lift dynamically, mimicking avian flight mechanisms, and thereby reducing takeoff speed requirements.

All major existing flight technologies rely on propellers or jets, which are often noisy, inefficient, environmentally unfriendly, and not easily accessible for personal use.
Using birdlike wings that automatically control aerodynamics and wing profile could mitigate all negative aspects, making it possible for virtually everyone to fly.

2. Description of the Invention

The system consists of:

- **Lightweight, bio-inspired wing structures** optimized for flapping motion.
- **Actuators** capable of mimicking muscle action, such as electroactive polymers (EAPs), electric motors, or other advanced mechanisms.
- **Integrated control systems** for coordinated wing motion and flight stability.
- **Power supply and energy storage** designed for wearable use.
- **Safety and ergonomic features** for comfortable human wear and operation.

The invention conceptually aims to lift a human's full weight (approximately 80 kg plus system mass), targeting controlled flight from near standstill conditions, though this remains a significant technical challenge.

Technical Feasibility Note: Scaling avian-like flapping systems to lift a human introduces significant challenges in power density, actuation speed, and structural strength, as human weight is 20–100x that of the largest birds. While the concept envisions full-body lift using flapping wing systems, achieving sufficient lift for an 80kg person remains a major technical challenge, requiring breakthroughs in actuator strength-to-weight ratios, energy density, and materials engineering. This document serves as an early-stage conceptual disclosure and invites collaborative development to overcome these challenges.

3. Main Components

1. **Wing Frame and Membranes**: Designed for strength and flexibility, mimicking bird wing anatomy.
2. **Actuation System**: Using EAPs and/or electric motors to produce flapping motions.
3. **Control Unit**: Sensors and microcontrollers to coordinate wing movement and maintain stability.
4. **Power Source**: Lightweight batteries or alternative energy storage suitable for sustained flight.
5. **Harness and Support Structure**: Distributes loads and ensures wearer comfort and safety.
6. **Passive Glide Mode**: The wing structure is designed to allow unpowered gliding in the event of system failure, enhancing user safety by providing an emergency descent capability, similar to gliding, in the event of active system failure or power depletion.

The sizes of the Birdlike Wings for Humans can range from compact, lightweight models designed for ease of mobility to larger variants capable of extended gliding over broad areas.

The wing surface materials should be chosen according to their intended use, from heat-resistant to feather-like long-range fliers.

Once the technology and associated knowledge mature, it may also become possible to use the system without any physical arm controls, enabling operation through brain-computer interfaces (BCIs) — particularly benefiting individuals with disabilities.

4. Current context and innovation

While the human body is inherently unsuited for flight without assistance, technological aids may enable performance exceeding that of natural flyers.
Unlike previous personal flight systems (jetpacks, eVTOLs, etc.), this design eliminates the need for propellers or turbines. Instead, it adopts a biologically inspired flapping mechanism similar to birds, aiming for quieter, more efficient, and environmentally friendly flight from a standing start. Such an integrated use of modern materials, EAP actuators, AI control, and wearable design has not yet been realized in human aviation technology.
Despite significant advances in materials, energy systems, and AI, their combined application in a wearable flapping-wing system remains unexplored. This invention proposes to bridge these technological fields.

While various ornithopter drones and large-scale flapping-wing prototypes have been explored, no known system has been designed as a fully wearable, human-powered or BCI-compatible personal flight system.

5. Potential Applications

- Personal transportation
- **Emergency response and rescue operations**
- Recreational and sporting activities
- Assistance for people with disabilities

6. Open Collaboration Statement

This invention is disclosed **without patent restrictions** and dedicated to the public domain.

The purpose is to encourage researchers, developers, universities, and innovators worldwide to freely explore, develop, and improve upon this concept without legal barriers.

Significant challenges remain, including mechanical design, power-to-weight optimization, control algorithms, and comprehensive safety measures. However, through open collaboration and shared knowledge, this technology can progress more rapidly for the benefit of all.

7. Challenges and Next Steps

Due to the Birdlike Wings system's complexity and the requirement of specialized hardware, building a prototype requires collaboration with experts and resources beyond my current capacity. I encourage researchers, engineers, and organizations interested in developing this concept to reach out for collaboration.

This wearable flapping wing system represents a bold step toward practical human flight. By openly sharing this invention, I invite the global community to join in advancing the future of personal aviation.

With shared effort and innovation, this concept could lay the groundwork for a new era of sustainable, human-integrated personal flight.

8. Conclusion

This concept represents an invitation to explore new frontiers in personal aviation, blending bio-inspired design with modern technology for the benefit of all.

9. Attribution

This idea and design are the original work of Josef David.

Contact: inventor@saved.cz / http://www.saved.cz