Helmet with multi-directional suspension system and helmet manufacturing process

Development status

Phase 2

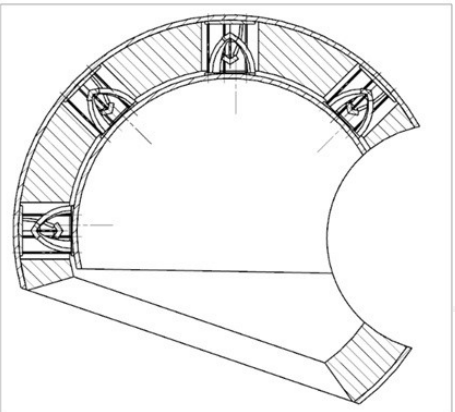
Feasibility study. There is a realistic design of the technology and the initial tests in the laboratory are leading to the specification of the technology requirements and its capabilities.

IP protection status

Published PCT and Czech Patent (309734)

Partnering strategy

Collaboration, licensing



Institution

Challenge

Currently, most helmets (motorcycle, bicycle, sports) only protect against linear acceleration by dissipating energy in a protective layer of expanded polystyrene foam (EPS) during both normal and tangential impacts. However, the new ECE R22.06 standard expects helmets certified for motorcycles to also protect against rotational acceleration induced by oblique impacts. In these impacts, the EPS layer will no longer protect the rider. Our invention provides an innovative solution to help minimize the effects of these impacts.

Description

The invention provides a helmet with a special suspension system based on couplings transmitting a single thrust (tensegrity coupling). The invention could bring to the market a new helmet which will meet the conditions for protection against rotational acceleration (according to ECE R22.06). The advantage of the new design is the possibility of relative movement between the inner and outer shell of the helmet. The indirect (hinged) connection between the inner and outer shells allows the outer shell to rotate independently before the motion is transferred to the inner shell (in the event of an oblique impact) and subsequently to the head and brain. Indirect coupling is implemented by a special helmet design where the outer and inner shells are connected only by tensegrity couplings and the inner layer is not attached to the soft layer (this feature allows relative rotation between the inner and outer shells). The tensegrity couplings also maintain the structural integrity of the helmet. This coupling could reduce the rotational acceleration that the driver's head and brain suffer in an oblique impact. Our innovative solution to the problem is currently pending a published Czech (2021-499) and PCT patent application.

Commercial opportunity

Appliaction to the new types of motorcycle helmets to meet the ECE R22.06 standard (for helmets manufacturers sutch as : AGV, Shubert,

SHOEI)

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