SWALLOWING SIMULATION APPRATUS AND METHOD

ABSTRACT

A swallowing simulation apparatus that facilitate approximately reproducing an actual phenomenon of swallowing and allows quantifying a physical quantity related to a behavior and a physical property of an orally-ingested product is provided. The swallowing simulation apparatus 100A comprises a head-and-neck modeling unit 10 configured to form a dynamic three-dimensional model of the head-and-neck 10a that includes head-and-neck organs, an organ movement setting unit 30 configured to set movements of the respective head-and-neck organs in the dynamic three-dimensional model of the head-and-neck, an orally-ingested-product physical-property setting unit 40 configured to set an orally-ingested product as an analysis target and a physical property of the orally-ingested product, an input unit 81 configured to input a pseudo-orally-ingested product 20 formed by modeling the orally-ingested product to an oral cavity, amovement analysis unit 50 configured to analyze the movements of the respective head-and-neck organs in the dynamic three-dimensional model of the head-and-neck 10a and a behavior of the pseudo-orally-ingested product 20 during swallowed in a three-dimensional space using a particle method, and a display unit 82 configured to display an analysis result of the movements of the respective head-and-neck organs and the behavior of the pseudo-orally-ingested product during swallowed that are analyzed by the movement analysis unit 50 on a movement screen.

FIG. 2

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A swallowing simulation apparatus that facilitate approximately reproducing an actual phenomenon of swallowing and allows quantifying a physical quantity related to a behavior and a physical property of an orally-ingested product is provided. The swallowing simulation apparatus 100A comprises a head-and-neck modeling unit 10 configured to form a dynamic three-dimensional model of the head-and-neck 10a that includes head-and-neck organs, an organ movement setting unit 30 configured to set movements of the respective head-and-neck organs in the dynamic three-dimensional model of the head-and-neck, an orally-ingested-product physical-property setting unit 40 configured to set an orally-ingested product as an analysis target and a physical property of the orally-ingested product, an input unit 81 configured to input a pseudo-orally-ingested product 20 formed by modeling the orally-ingested product to an oral cavity, amovement analysis unit 50 configured to analyze the movements of the respective head-and-neck organs in the dynamic three-dimensional model of the head-and-neck 10a and a behavior of the pseudo-orally-ingested product 20 during swallowed in a three-dimensional space using a particle method, and a display unit 82 configured to display an analysis result of the movements of the respective head-and-neck organs and the behavior of the pseudo-orally-ingested product during swallowed that are analyzed by the movement analysis unit 50 on a movement screen.

FIG. 2