PARALLEL TRANSLATION, PUSHING, DRIVING AND LOCKING MECHANISM DESIGN OF THE ENDO SURGICAL INSTRUMENT

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This biomedical surgical instrument which is used to wide-open, cut, and close tissues and apparatus when operating is designed to help doctors deal with patients who need minimally invasive surgery. Doctors squeeze the trigger of the surgical instrument and the endo-clips are pushed out and deformed to clip tissues or apparatus.

This paper mainly depicts four mechanism of the biomedical surgical instrument: parallel translation, pushing, driving, and locking mechanism. Inner endo-clips are pushed together by parallel translation mechanism firstly and then the heading clip is pushed into the “Jaw” by pushing mechanism for further deformation. Driving mechanism translates users squeezing force into pushing forces for previous two mechanisms. The locking mechanism is designed to guarantee that every squeezing by users, only one clip can be pushed into the jaw. Overall, these four mechanisms are designed to satisfy certain displacement changes and some loads of some accessories. Mathemetic theory and 3D modeling and FEA simulation have been used to analysis displacement changes and accessories’ loading. Finally, the paper indicates the direction of the future development.

Keywords: Endo clip, Surgical instrument, Biomedical Mechanism

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