The Application of Space Separation in PhysicalContradiction-Exemplified by the Design Circumvention of the Guiding Dev

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ABSTRACT

This research is mainly to do the innovation on improvement of guiding device in the manual strapping tool. The guiding device is used to strap cylindrical objects. Currently, innovation is few on the design improvement of manual strapping tool. But in the packaging industry, strapping operations are used in many places, so it is an important issue to innovate the manual strapping tool. The patent M255219, with title as “ the structure of guiding device in manual strapping tool ”, is selected as the target case to demonstrate the innovation improvement. Reading the content in M255219, it produces component hierarchy table and component relationship chart. Then functional analysis is drawn to identify the root cause of harmful function. TRIZ method on space separation is implemented to solve the physical contradiction embedded in the harmful function. A new result is thus created to circumvent the patent claims in the original patent. The new design does not meet the requirements of the “ all elements rule ” when compared to the previous patent. It ensures that the new design circumvents the patent claims proposed in the previous patent. In the original design, the lower member of the guiding device is long compared to its upper member, and strap could jeopardize the lower cutter. Whereas, the new design comes with shorter lower member of the guiding device and circumvent the problem of hurting the lower cutter. Finally, a SolidWorks is used to demonstrate the new design.

Keywords : functional analysis, manual strapping tool, patent circumvention, physical contradiction

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