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ENTRY NUMBER: 2022MEB1307

PROBLEM STATEMENT: Design a 4 Jaw chuck and a chuck drill key to solve the problem for holding and to secure the workpiece for lathe while a drill key is for tightening or loosening the jaws of a drill chuck.

OBJECTIVE : To model the 4 Jaw chuck and key Using Solidworks to solve the above problem .

SHORT DESCRIPTION : A four-jaw chuck is a mechanical device used in machining that securely holds and clamps workpieces in place during drilling, milling, or turning operations. Unlike a three-jaw chuck, it offers greater flexibility by allowing independent adjustment of each jaw, accommodating irregularly shaped or non-concentric workpieces with precision.

A chuck drill key, commonly referred to as a chuck key, is a specialized tool used to tighten or loosen the jaws of a chuck. It fits into the chuck's keyhole and enables the user to adjust the jaws to secure or release the workpiece. This key is pivotal in the operation and maintenance of various drilling machines, ensuring proper grip and safety.

In total I have prepared 8 sub parts [6-four jaw chuck 2-key] ::

- a) Spindle screw: Spindle screw in 4-jaw chuck secures workpiece for precision.
- b) Screw fixer::Tool securing workpieces firmly within a four-jaw chuck mechanism.

- c) Lock pin :: Secures workpiece in place for machining accuracy and stability.
- d) Chuck jaw: A component in a four-jaw chuck that independently adjusts to hold irregularly shaped workpieces securely during machining.
- e) Body:: Holds irregularly shaped workpieces for machining
- f) Pilot:: In the context of a drill chuck key, a pilot refers to a small, often cylindrical protrusion located at the end of the key. This pilot serves as a guide or a locating feature, typically fitting into a corresponding hole or slot on the chuck of a drill