central workpiece handling element 38 is configured to hold a flat solid workpiece but not configured to hold a flat workpiece having a central opening therein.

**[0033]** FIG. 6 and FIG. 7 show a workpiece aligner apparatus 50 with a robot blade 60 configured to load a workpiece (not shown) onto the workpiece aligner apparatus 50. A controller 62, including a central processing unit (CPU) 64, a memory 66 and support circuits 68, is coupled to the workpiece aligner apparatus 50 to facilitate control loading of a workpiece, unloading of a workpiece and alignment of a workpiece placed on the workpiece aligner apparatus 50. The memory 66 can be any computer-readable medium, such as random access memory (RAM), read only memory (ROM), floppy disk, hard disk, or any other form of digital storage, local or remote to the workpiece aligner apparatus 50 or CPU 64. The support circuits 68 are coupled to the CPU 64 for supporting the CPU 64 in a conventional manner. These circuits can include cache, power supplies, clock circuits, input/output circuitry and subsystem, and the like. A software routine or a series of program instructions stored in the memory 66, when executed by the CPU 64, causes the workpiece to be loaded onto the workpiece aligner apparatus 50 by the robot blade 60, and the aligner apparatus to align the workpiece. Thus, the controller 62 controls rotation of the arm 32 and communicates with controller that controls movement of the robot blade 60 to load a workpiece. In some embodiments, rotation of the arm 32 and movement of the robot blade 60 may be controlled by a single controller 62.

**[0034]** With reference to FIGs. 6 and 7, which show a robot blade (FIG. 6) being moved towards the aligner to load a workpiece (not shown) using the first edge gripping element 34 and the second edge gripping element 36. In FIG. 7, the arm 32 is shown as 32' and 32", indicated by the dotted and dashed lines, which show a first rotational position or range of first rotational positions in which the robot blade 60 can load the workpiece to be held by the first edge gripping element 34 and the second edge gripping element 36. FIG. 7 shows a range of rotational positions depicted by arrows 72 and 74 that provide rotational positions where the robot blade 60 can load the workpiece without interference from the first edge gripping element 34 or the second edge gripping element 36. Zones 71 and 73 are indicated in FIG. 7 as zones in which the robot blade 60 contact either the first edge gripping element 34 and second edge gripping element, and thus the first edge gripping element 34 or the second edge gripping element 36 would interfere with the robot blade 60 and prevent loading of the workpiece. As an example only, the arm 32 cannot be in the 135 degree to 225 degree position