CLAIMS

1. A system for bonding a first metal workpiece and a second metal workpiece together, the system comprising:

a frame;

a platform to which the first workpiece is securable;

at least one fastener assembly connecting the platform to the frame, said at least one fastener assembly permitting the platform to move relative to the frame along a predetermined oscillation path;

a locating assembly, for locating the second workpiece in a predetermined position relative to the first workpiece to define a gap therebetween when the first workpiece is secured to the platform;

at least one gear including a plurality of teeth and mounted for rotation about an axis thereof, said at least one gear being positioned for engagement with the platform, for oscillating movement of the platform along the predetermined oscillation path;

at least one heating element, to be positioned in the gap, for heating respective heated portions of the first and second workpieces to their hot working temperatures at which the heated portions are at least partially plastically deformable, said at least one heating element being removable from the gap when the heated portions are at their hot working temperatures; and

apparatus for urging the first and second workpieces against each other, while the heated portions are at their hot working temperatures and while the first workpiece is oscillated along the predetermined oscillation path, to bond the first and second workpieces together.

2. A system according to claim 1 in which said at least one gear comprises:

a first gear positioned for engagement with a first side of the platform; and

a second gear positioned for engagement with a second side of the platform that is opposite to the first side thereof;

the first and second gears being coordinated to cause oscillation of the platform along the predetermined oscillation path.

3. A system according to claim 1 in which said at least one gear comprises a first gear positioned for engagement with a first side of the platform, for intermittent movement of the platform in a first direction; and

the system additionally comprises a resilient element positioned for engagement with a second side of the platform that is opposed to the first side thereof, for resiliently responding to the movement of the platform in the first direction by urging the platform in a second direction opposite to the first direction.

4. A system for bonding a first metal workpiece to a second metal workpiece comprising:

a platform for receiving the first metal workpiece, the platform including at least one projection on one side of the platform;

a locating assembly for receiving the second metal workpiece and for locating the second metal workpiece in a predetermined position to define a gap between the first and second metal workpieces;

at least one gear positioned to a side of the platform, the at least one gear including a set of gear teeth and teeth gaps between the set of gear teeth for receiving the projection;

an apparatus for rotating the at least one gear causing the projection to travel between the set of gear teeth and teeth gaps;

at least one heating element located in the gap between the first and second metal workpieces to heat heated portions of the first and second metal workpieces to their hot working temperatures;

wherein when the heated portions are at their hot working temperatures. rotation of the at least one gear causes the platform to move along a predetermined oscillation path causing edges of the first and second metal workpieces to bond or fuse together.

5. The apparatus of Claim 4 further comprising:

an apparatus for forcing the first and second metal workpieces together while the edges of the first and second metal workpieces are bonding or fusing together.

6. The apparatus of Claim 4 further comprising:

a second projection located on a side of the platform opposite the at least one projection; and

a second gear, the second located on a side of the platform opposite the at least one gear, the second gear including a set of gear teeth and teeth gaps between the set of gear teeth for receiving the second projection; and

a second apparatus for rotating the at second gear causing the second projection to travel between the set of gear teeth and teeth gaps of the second gear.

7. The apparatus of Claim 6 wherein when the at least one projection is located in one of the teeth gaps for the at least one gear, the second projection abuts one of the gear teeth of the second gear.

8. The apparatus of Claim 6 wherein when the at least one projection is located in one of the teeth gaps for the at least one gear, the second projection is located in one of the teeth gaps of the second gear.