CLAIMS

1. A stencil printer for printing viscous material on a substrate, the stencil printer comprising:

a frame;

a stencil coupled to the frame;

a print head, coupled to the frame, to deposit and print viscous material over the stencil;

a lift table assembly configured to support the substrate in a transport position and a print position; and

a conveyor system including a pair of rail members coupled to the frame, the pair of rail members extending through the frame and being configured to transport the substrate through the stencil printer, and for each rail member, a lift tool assembly coupled to the rail member, the lift tool assembly being configured to cooperate with the lift table assembly and to engage and support the substrate at a transport height and a print height, the lift tool assembly including

a lifter portion,

a main plate secured to the lifter portion,

a clamping member coupled to the main plate, the clamping member being configured to move horizontally between a substrate engaged position and a substrate disengaged position,

a thin foil coupled to the main plate, the thin foil being configured to move vertically and horizontally, independent from the clamping member,

at least one first linear actuator coupled to the clamping member to move the clamping member between the substrate engaged position and the substrate disengaged position, and

at least one second linear actuator coupled to the thin foil to move the thin foil in a vertical direction, the at least one second linear actuator being configured to drive the up and down movement of a guide plate and a mount plate on which a foil plate having the thin foil is mounted.

2. The stencil printer of claim 1, wherein the lift tool assembly further includes a bracket secured to the clamping member, the bracket being moved by the at least one linear actuator to move the clamping member between the substrate engaged position and the substrate disengaged position.

3. The stencil printer of claim 1, wherein the lift tool assembly further includes at least one third linear actuator coupled to the thin foil to move the thin foil in a horizontal direction.

4. The stencil printer of claim 3, the at least one third linear actuator is configured to drive the left and right movement of a mount plate on which a foil plate having the thin foil is mounted.

5. The stencil printer of claim 4, wherein the at least one first linear actuator, the at least one second linear actuator and the at least one third linear actuator each include a pneumatic cylinder.

6. A method for supporting and clamping a substrate in a print position during a print operation of a stencil printer, the method comprising:

moving the substrate on a conveyor system having a pair of rails at a transport height over a lift table assembly;

clamping opposite edges of the substrate; and moving the substrate in a z-axis direction with a lift tool assembly coupled to each rail member,

wherein clamping opposite edges is achieved by a clamping assembly including

a main plate,

a clamping member coupled to the main plate, the clamping member being configured to move horizontally between a substrate engaged position and a substrate disengaged position,

a thin foil coupled to the main plate, the thin foil being configured to move vertically and horizontally, independent from the clamping member,

at least one first linear actuator coupled to the clamping member to move the clamping member between the substrate engaged position and the substrate disengaged position, and

at least one second linear actuator coupled to the thin foil to move the thin foil in a vertical direction, the at least one second linear actuator being configured to drive the up and down movement of a guide plate and a mount plate on which a foil plate having the thin foil is mounted.

7. The method of claim 6, wherein the clamping assembly further includes at least one third

linear actuator coupled to the thin foil to move the thin foil in a horizontal direction, the at least one third linear actuator being configured to drive the left and right movement of a mount plate on which a foil plate having the thin foil is mounted.

8. A conveyor system for a stencil printer of the type to print viscous material on a substrate, the conveyor system comprising:

a pair of rail members coupled to the frame, the pair of rail members extending through the frame and being configured to transport the substrate through the stencil printer; and

for each rail member, a lift tool assembly coupled to the rail member, the lift tool assembly being configured to cooperate with the lift table assembly and to engage and support the substrate at a transport height, a vision system clearance height and a print height, the lift tool assembly including

a lifter portion,

a main plate secured to the lifter portion,

a clamping member coupled to the main plate, the clamping member being configured to move horizontally between a substrate engaged position and a substrate disengaged position,

a thin foil coupled to the main plate, the thin foil being configured to move vertically and horizontally, independent from the clamping member,

at least one first linear actuator coupled to the clamping member to move the clamping member between the substrate engaged position and the substrate disengaged position, and

at least one second linear actuator coupled to the thin foil to move the thin foil in a vertical direction, the at least one second linear actuator being configured to drive the up and down movement of a guide plate and a mount plate on which a foil plate having the thin foil is mounted.

9. The conveyor system of claim 8, wherein the lift tool assembly further a bracket secured to the clamping member, the bracket being moved by the at least one linear actuator to move the clamping member between the substrate engaged position and the substrate disengaged position.

10. The conveyor system of claim 8, wherein the lift tool assembly further includes at least one third linear actuator coupled to the thin foil to move the thin foil in a horizontal direction.

11. The conveyor system of claim 10, the at least one third linear actuator is configured to drive the left and right movement of a mount plate on which a foil plate having the thin foil is mounted.

12. The conveyor system of claim 11, wherein the at least one first linear actuator, the at least one second linear actuator and the at least one third linear actuator each include a pneumatic cylinder.