Claims

1. A method for printing workpieces having a first pitch along a horizontal transport path using a printing machine, the printing machine comprising:

a rising table being vertically movable between a lower, retracted position and an upper, extended position, and

tooling fitted to the rising table to be carried therewith, the tooling comprising a plurality of discrete and horizontally spaced support surfaces,

the arrangement being such that in use workpieces are conveyed into and through the printing machine along the horizontal transport path, which is vertically above the tooling when the rising table is in the retracted position, and a support surface may be brought into engagement with a workpiece by raising the rising table toward the extended position, to enable a printing operation to be performed to print the engaged workpiece

the method comprising transporting a plurality of workpieces to be printed into the printing machine along the horizontal transport path,

wherein the plurality of support surfaces are spaced along the horizontal transport path at a second pitch which is greater than the first pitch, and

the transport is controlled such that each workpiece of the plurality of workpieces is stopped at respective first and second locations within the printing machine, the first and second locations being spaced along the horizontal transport path and each being located directly above the rising table when in its retracted position, with at least one of the first and second locations being directly located above a support surface of the tooling.

2. The method of claim 1, wherein the workpieces to be printed include at least one workpiece in a first array, and at least one workpiece in a second array, the workpieces of the first and second arrays being interleaved along the horizontal transport path, the method comprising the steps of:

i) controlling the transport to move the plurality of workpieces along the horizontal transport path and stop a workpiece of the first array at a first respective location in which it directly overlies a support surface, and stop a workpiece of the second array at a first respective location in which it directly overlies the rising table but not a support surface,

ii) raising the rising table to bring the workpiece of the first array into engagement with its underlying support surface,

iii) performing a first print operation to print the engaged workpiece of the first array,

iv) lowering the rising table to bring the printed workpiece of the first array out of engagement with the support surface,

v) controlling the transport to move the plurality of workpieces along the horizontal transport path and stop the workpiece of the second array at a second respective location in which it directly overlies a support surface, and stop the workpiece of the first array at a second respective location in which it directly overlies the rising table but not a support surface,

vi) raising the rising table to bring the workpiece of the second array into engagement with its underlying support surface,

vii) performing a second print operation to print the engaged workpiece in the second array, and

viii) lowering the rising table to bring the printed workpiece of the second array out of engagement with the support surface.

3. The method of claim 2, wherein a workpiece of the first array and a workpiece of the second array are conveyed into the printing machine on a common carrier, and in step i) the carrier is transported to a first carrier location along the horizontal transport path, and in step v) the carrier is transported to a second carrier location along the horizontal transport path.

4. The method of claim 1, wherein a plurality of stopping locations are provided along the horizontal transport path, and the transport is controlled such that each workpiece is stopped at a selected respective stopping location; optionally a workpiece is stopped at each stopping location, and a single printing operation is performed to print every workpiece which is stopped at a stopping location.

5. The method of any preceding claim, wherein the tooling comprises a plurality of towers, each support surface being located at an upper end of a respective tower, and each

support surface is moveable within the horizontal plane.

6. The method of claim 5, wherein each support surface is translatable both parallel to the horizontal path and orthogonally to the horizontal path within the horizontal plane, and rotatable about a respective vertical axis.

7. The method of either of claims 5 and 6, comprising stopping a workpiece at a first location in which it directly overlies first and second support surfaces, such that raising of the rising table toward the extended position brings both the first and second support surfaces into engagement with the workpiece.

8. The method of claim 7, comprising the step of adjusting the position and / or rotation of the workpiece by moving the first and second support surfaces when engaged with the workpiece.

9. A computer program for controlling a printing machine to perform the method of any preceding claim.

10. A printing machine for printing workpieces having a first pitch along a horizontal transport path, comprising:

a rising table being vertically movable between a lower, retracted position and an upper, extended position,

tooling fitted to the rising table to be carried therewith, the tooling comprising a plurality of discrete and horizontally spaced support surfaces,

a conveyor operable to transport workpieces into and through the printing machine along the horizontal transport path, which is vertically above the tooling when the rising table is in the retracted position, and

wherein the plurality of support surfaces are spaced along the horizontal transport path at a second pitch which is greater than the first pitch, and

the printing machine further comprising a transport control system operable to selectively stop a workpiece on the conveyor at either a first or a second location within the printing machine, the first and second locations being spaced along the horizontal transport

path and each being located directly above the rising table when in its retracted position, with at least one of the first and second locations being directly located above a support surface of the tooling.

11. The printing machine of claim 10, wherein the transport control system comprises:

a first physical stop element operable to stop a workpiece at the first location, and

a second physical stop element operable to stop a workpiece at the second location.

12. The printing machine of claim 10, wherein the transport control system comprises:

a conveyor control operable to control the operation of the conveyor to bring a workpiece to a stop at a selected one of the first and second locations.

13. The printing machine of claim 12, wherein the transport control system comprises:

a sensor associated with each of the first and second locations to sense the presence of a workpiece on the conveyor upstream of the respective location and pass a signal indicative of such presence to the conveyor control.

14. A method for aligning a workpiece for printing within a printing machine, the printing machine comprising:

a rising table being vertically movable between a lower, retracted position and an upper, extended position, and

tooling fitted to the rising table to be carried therewith, the tooling comprising a plurality of discrete and horizontally spaced support surfaces, wherein the tooling comprises a plurality of towers, each support surface of the plurality of support surfaces being located at an upper end of a respective tower, and each support surface is moveable within the horizontal plane, and wherein each tower is individually actuable to translate its support surface both parallel to the horizontal path and orthogonally to the horizontal path within the horizontal plane, and rotate the support surface about a respective vertical axis,

wherein the method comprises the steps of:

i) transporting a workpiece into and through the printing machine along a horizontal transport path,

ii) stopping the workpiece at a location in which the workpiece directly overlies first and second support surfaces of the plurality of support surfaces,

iii) bringing the workpiece into engagement with both the first and second support surfaces, and

iv) aligning the workpiece by moving the first and second support surfaces while engaged with the workpiece.