

-27-

Claims

What is claimed is:

1. A print head for an additive manufacturing system, comprising:
a receiving end configured to receive a matrix and a continuous reinforcement;
a discharging end configured to discharge the continuous reinforcement at least partially coated in the matrix; and
a compactor located at the discharging end and forming a tool center point for the print head.
2. The print head of claim 1, wherein the continuous reinforcement contacts the compactor before contacting a surface onto which the continuous reinforcement is to be discharged.
3. The print head of claim 1, wherein:
the continuous reinforcement is at least partially coated with the matrix at a location inside of the print head; and
the print head further includes a guide module configured to disburse the matrix through the continuous reinforcement, the guide module including at least one contact surface that generates a pressure differential within the continuous reinforcement.
4. The print head of claim 3, wherein the continuous reinforcement is at least partially coated with the matrix inside the guide module at a location upstream of the at least one contact surface.
5. The print head of claim 3, wherein the guide module includes:
at least one entrant roller; and
a piloting subassembly located downstream of the at least one entrant roller.
6. The print head of claim 1, further including a final guide associated with the compactor, wherein the final guide is configured to bias the continuous reinforcement toward the compactor.

-28-

7. The print head of claim 1, wherein the compactor is moveable from a threading position away from the continuous reinforcement to a compacting position against the continuous reinforcement.

8. The print head of claim 7, wherein the compactor is further moveable at the compacting position to adjust a pressure exerted by the compactor on the continuous reinforcement.

9. The print head of claim 7, further including:
an actuator configured to adjust positions of the compactor; and
a lash adjuster located between the actuator and the compactor.

10. The print head of claim 1, further including a curing module configured to direct cure energy to a location trailing the compactor.

11. A method of additively manufacturing a composite structure, comprising:
directing a matrix and a continuous reinforcement into a nozzle-less print head;
passing the continuous reinforcement through a guiding module that maintains alignment of the continuous reinforcement;
compacting the matrix and the continuous reinforcement at discharge from the nozzle-less print head with a compactor; and
exposing the matrix to a cure energy after compacting.

12. The method of claim 11, further including moving the print head during discharge based on a tool center point located at the compactor.

13. The method of claim 11, further including discharging the continuous reinforcement first onto the compactor before onto a surface on which the continuous reinforcement is compacted.

14. The method of claim 11, further including at least partially coating the continuous reinforcement with the matrix inside of the nozzle-less print head.

15. The method of claim 11, further including generating a pressure differential through the continuous reinforcement to disburse the matrix.