

**REQUEST FOR REFERENCES**  
**U.S. PATENT APP. NO. 12/976,111:**  
**PRINT HEAD ASSEMBLY FOR USE IN FUSED DEPOSITION MODELING SYSTEM**

**I. BASIC APPLICATION DATA:**

- a. **App Number:** 12/976,111
- b. **Assignee:** Stratasys, Inc.
- c. **Prior Art Cutoff Date:** 12/22/2010
- d. **Availability for Challenge:** Open Until 12/28/2012

**II. APPLICATION OVERVIEW:**

This application claims a print head assembly for use in fused deposition modeling (FDM) 3D printing. The print head assembly is made of a carriage frame retained by a gantry mechanism, very similar to technology used in an ordinary inkjet printer, and a receptacle that will accept removable print heads. The receptacle has alignment features and a lid to ensure that the removable print head stays in a fixed position relative to the carriage frame, to improve print quality.

**III. WHY IT MATTERS:**

Combining traditional inkjet printing technologies with 3D printers to allow for more efficient printing or better printer designs offers an obvious way to improve 3D printing technology. Allowing a patent to be granted for such a simple application of well-known technologies to 3D printing could seriously threaten the ability to continue improving the designs of 3D printers.

**IV. INDEPENDENT CLAIMS & REFERENCES NEEDED:**

**a. Claim 1:**

*A print head assembly for use in a fused deposition modeling system, the print head assembly comprising:*

*a carriage frame configured to be retained by a gantry mechanism of the fused deposition modeling system; and*

*a receptacle comprising:*

*a base portion supported from the carriage frame and configured to receive a removable print head, wherein the base portion comprises an alignment feature configured to engage with a reciprocal alignment feature of the received print head; and*

*a lid configured to close against the base portion to retain the received print head at least partially within the receptacle.*

This claim includes two core concepts from inkjet printers (carriage frame retained by a gantry mechanism and a receptacle which ensures proper alignment of the print head) as applied to a fused deposition modeling 3D printer. **References describing both of these technologies implemented in any sort of printer would be very helpful here, and the more 3D-printer-like, the better.** It's also important to note that the alignment mentioned here is a reciprocal alignment system, relying both on features of the receptacle and of the removable print head – references should similarly demonstrate a reciprocal alignment system. Other claims in this patent that elaborate on claim 1 (“dependent claims”)

further describe electrical circuits on the lid connected to a control board interface, so any references describing similar means of electrical communication in a printer would also be very helpful in limiting the scope of these claims.

**b. Claim 21:**

*A print head assembly for use in a fused deposition modeling system, the print head assembly comprising:*

*a carriage frame configured to be retained by a gantry mechanism of the fused deposition modeling system; and*

*a receptacle for use with a removable print head having a cartridge assembly and a liquefier pump assembly, the receptacle comprising:*

*a base portion supported from the carriage frame and is configured to receive the cartridge assembly of the removable print head, wherein the base portion comprises an alignment feature configured to engage with a reciprocal alignment feature of the received cartridge assembly; and*

*a lid configured to close against the base portion to retain the received cartridge assembly at least partially within the receptacle, and such that the liquefier pump assembly is located outside of the receptacle*

This claim is largely similar to claim 1 and its dependent claims are also nearly identical, so similar references will work. The key difference is that this claim further specifies that the print head comprises a cartridge assembly and liquefier pump assembly. **References describing other fused deposition modeling systems (or, less helpfully, any other kind of printing systems) that use a cartridge + liquefier system would be helpful to show that this small difference is still an obvious implementation of already well-known technology.**