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## AUTOMATIC FUSING LAMPS CLEANING FOR 3D PRINTER

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## **Automatic Fusing Lamps Cleaning for 3D Printer**

**Abstract:** In a powder-based additive manufacturing system, a heated wiper automatically cleans powder off the quartz glass cover of a fusing lamp.

This disclosure relates to the field of additive manufacturing.

A technique is disclosed that uses a heated wiper to automatically clean the quartz glass cover of a fusing lamp.

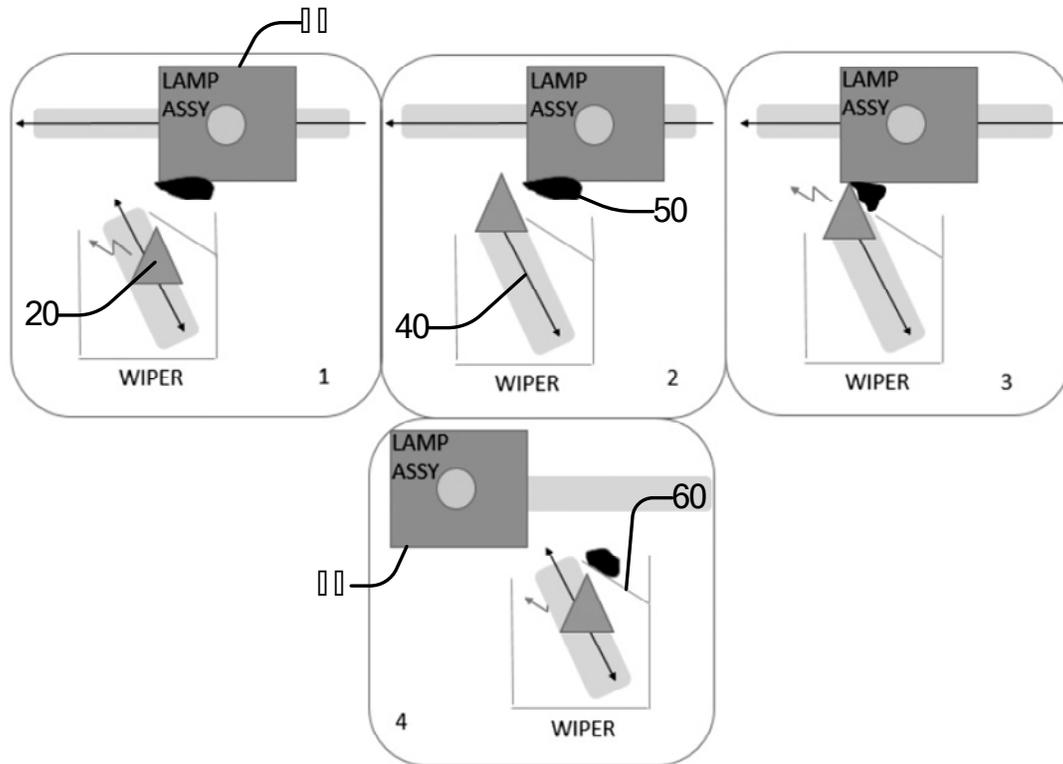
Additive manufacturing, also called 3D printing, is a technique for fabricating parts. Some 3D printers use a powder, such as for example polyamide, to create parts. If this powder gets onto hot parts in the printer (greater than about 180 degrees C) it melts and is difficult to remove. The fusing lamp enclosures are positioned close to the powder, and as a result powder can get stuck to it. Because the fusing lamps operate at a high temperature, the enclosure of the fusing lamps becomes hot enough to easily melt the powder with minimal contact. This may occur slowly as polyamide settles on the enclosure, or can happen instantaneously from a powder crash. When this happens, the powder needs to be removed to ensure that melted powder does not block the fusing light as this may compromise the 3D part building process, or adversely affect the integrity of the quartz glass due to hot spots. Unfortunately, cleaning the quartz glass can be a tedious and time consuming manual process. Sometimes a hot air gun is used to melt the powder again to assist with its removal.

According to the present disclosure, and as understood with reference to the Figure, a heated wiper cleans the quartz glass in an automatic process. The wiper heats the adhered powder to a sufficient temperature to facilitate removal, and then wipes the bottom side of the fusing lamps to remove the powder.

The fusing lamp is integrated into a lamp assembly 10, a structure with a glass, at a bottom surface 15, to enable light to shine through the assembly 10. This glass is the one that gets dirty with powder and needs to be clean. In one example, a wiper 20 is built in a mechanism that includes a heated rubber, able to withstand the needed high temperature, that moves diagonally 40 by a motor. The wiper 20 is raised to clean the glass bottom 15, synchronized with the movement of the lamp assembly 10. The movement is illustrated from right to left in the sequence of positions 1 through 4. During a cleaning operation, the heated rubber of the wiper 20 contacts the bottom surface 15 of the assembly 10 with a sufficient force, at a sufficient temperature, to remove the adhered powder ("dirt") 50 from the glass surface 15 of the lamp assembly 10 as the lamp assembly 10 moves past the wiper 20. After the lamp assembly 10 has passed the wiper 20, the wiper 20 retracts. The removed dirt 50 is disposed in a special compartment 60 by creating a mechanical interference between the compartment and the wall of the wiper 20.

In some examples, this automatic process is performed between 3D part fabrication jobs. In other examples, it is performed during a service routine within a fabrication job, allowing for the temperature of the glass to be returned to the proper printing temperature before continuing the printing.

The disclosed technique advantageously enables automatic cleaning of the fusing lamps enclosure and quartz glass in a manner which is more efficient and more repetitive than a manual process.



*Disclosed by Marina Ferran Farres, Noel Liarte, and Sergio De Santiago, HP Inc.*