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METHOD OF PRINTING ON 3D PRINTED PARTS WITHOUT INTERFERING THE DESIGN BY USING THE SO CALLED "SHADOWING" EFFECT

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Method of printing on 3D printed parts without interfering the design by using the so called “shadowing” effect

Abstract

Customization is a very powerful advantage on 3D printing. Adding a text, a name, a logo or a pattern over a 3d printed part is cheaper and easier with some 3D printing technologies, such as fusing agent and powder-based systems, than with traditional technologies such as injection molding, where tools (molds, inserts...) need to be designed and fabricated for each customization.

However, sometimes the 3D models of the parts cannot be modified easily, especially if they are shared in specific formats or if their geometry is too thin or too delicate.

With this disclosure we propose a method to “dye” certain areas of a 3D printed part by using a phenomenon called “shadowing”, which is an inherent feature of some fusing agent and powder-based 3D printing technologies.. This method can be used to give the customer the option to mark their parts without interfering with their geometry.

Problems Solved

This disclosure pretends to facilitate the process of marking or labeling parts for the customer.

Nowadays, if a customer wants to add his logo on a 3D printed part, he has 2 options:

- 1) Either deboss it or emboss it.
- 2) Use a post-Processing step of dyeing, coating, etc.

Same happens in case he wants to add a text or a texture on the part. However, this process requires either modifying the geometry, which is not always possible, or adding more production steps.

This disclosure provides a solution for marking/labeling/printing on parts during the printing process

Prior Solutions

Previous methods of marking parts consist on either altering the part geometry (embossing or debossing) or applying some post processing (dyeing, etc..).

Description

The idea that we present is simple but very powerful. We know that in some fusing agent and powder-based 3D printing systems, when a part with a certain thickness is printed over a second part and placed very close to that second part, the surface of that second part gets a “shadow” of the part printed over it. This effect is called shadowing and it may be used to mark printed parts.

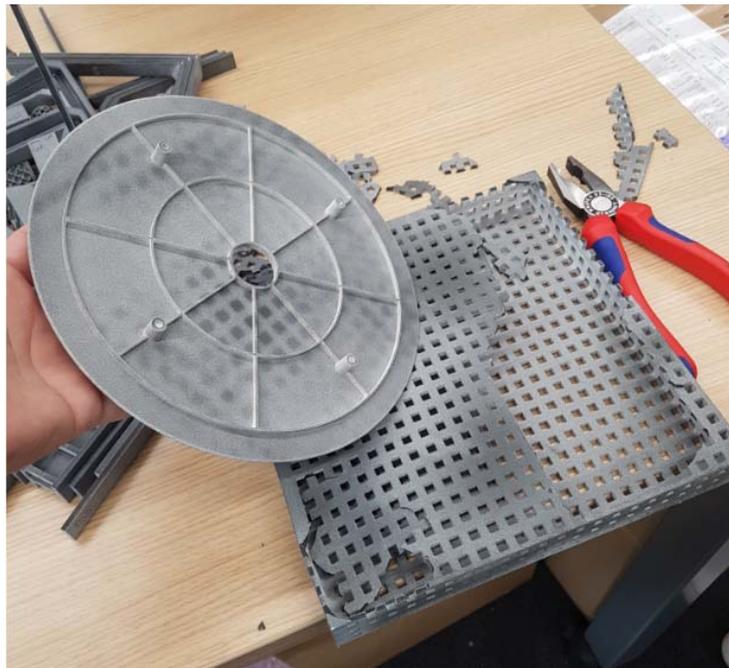


Fig 1.- Example of shadowing on a disc

The process is simple: On a build manager application, the customer will have an option to “mark” a part. After choosing it, a menu will show the different options

that the customer can choose to “mark” a part. These options are similar to the ones that 3D software offer now for “labeling” parts:

- Text: Write a text on a part
- Image: Insert an image and mark it on a part (useful for logos)
- Texture: A submenu of textures

After choosing an option, the software will create a new part on top of the selected part. This new part will have the design that the customer has chosen (or the text) on the XY plane, and a thickness in z enough to create the shadowing effect on the selected part.

Advantages

The main advantage of this idea is that the customer can mark the surface of a 3D printed part without altering its geometry and without adding another production step like a post processing step.

Disclosed by Armero, Miguel, Clavel, Carlos, Llosa, Ramon ~ HP Inc.