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EASY SERVICEABLE LOW-COST BELT TENSIONER

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Easy serviceable low-cost belt tensioner

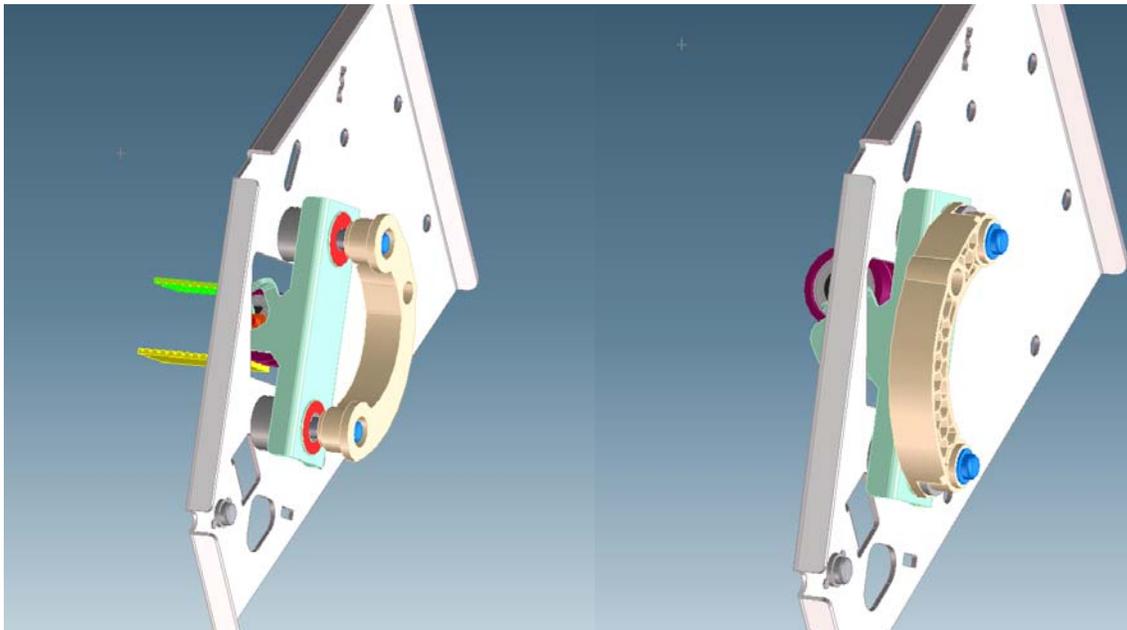
ABSTRACT

Working with a system that includes belt to provide motion to a carriage, this belt has to be tensioned in order to avoid belt problems, such as belt slippage in the motor pulley, belt flapping... There are different methods to provide belt tension, but in this case the main idea is to provide the tension by pulling the motive pulley.

To provide this motion and pull force to the motive pulley, an easy serviceable low-cost belt tensioner has been designed. This design includes a gauge, which depending how is coiled into 2 pem nuts allows to create belt tension due the springs or removes the belt tension bringing the springs into a block position.

LEFT: Galgue (brown part) screwed normal allowing the spring to generate belt tension.

RIGHT: Galgue (brown part) screwed reverse eliminating the belt tension by bringing the green part closer to the wall (grey pat) and so compressing the springs into block.



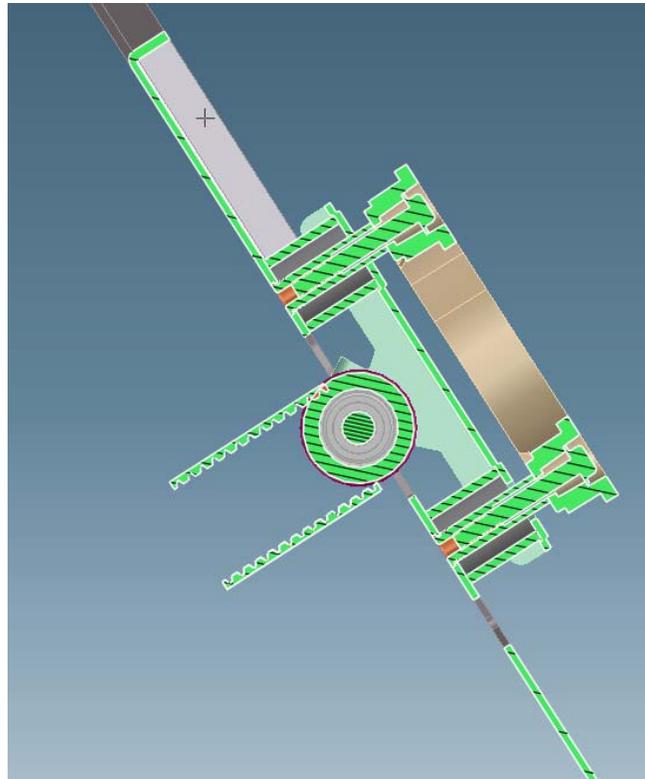
PROBLEMS SOLVED

The belt tensioning system is improved by reducing the parts thus the cost. Also, this design improves the time by changing the belt during a serviceability process. The idea is just to screw the galgue part in the other way (rotating 180°)

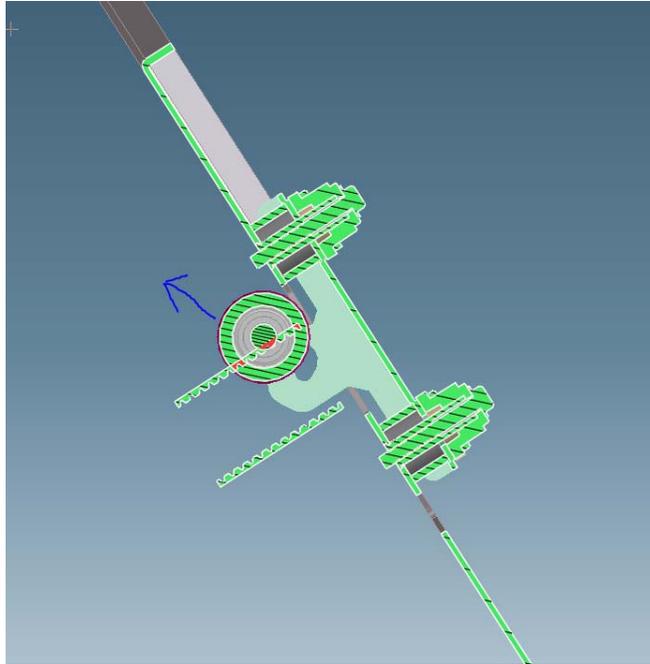
LOW COST TENSIONER AND EASY SERVICE

This design consists in a belt tensioner which only uses 2 springs and a pulley holder to provide tension to the belt through the idle pulley. To control the movement of the springs we use 2 pem nuts which are guiding the movement of the pulley holder in the X direction.

For being able to add or remove the belt tension to the belt a plastic part called gauge is used plus 2 screws, which depending the direction that we screw the part through the pem nuts we can add or remove the tension. This is a super-fast way to remove the idle pulley and the belt, which reduces the time of a service engineer while a reparation in the field.

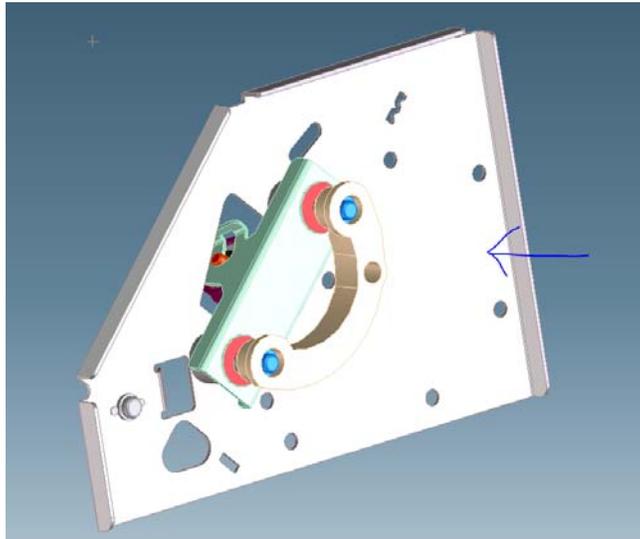


Normal belt tension



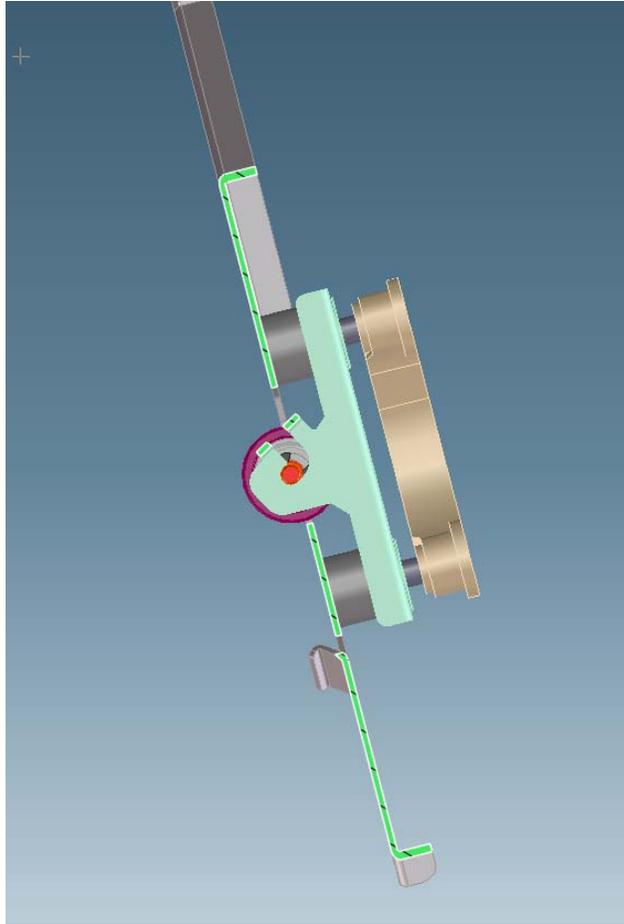
Removing belt tension being able to remove the idle pulley

Our solution allows a reduction of the number of parts because we are using the sideplate shown below with the blue line:



Also, we use standard pem nuts to guide the green part, which has a low cost.

Moreover, we reduce the foot print of the printer because we are positioning the pulley between the sideplate, which in the other designs was impossible to do, because they are attaching the magenta part to the sideplate, so they cannot put a hole. This is shown in the image below.



IN COMPARISON WITH PREVIOUS SYSTEMS

Advantages:

- Lower cost
- Reduce the foot print of the printer
- Make it easier to do serviceability for the belt and the idle pulley

PROTOTYPE



This is an image of a prototype once it is build and tensioning the belt. If we want to remove the tension of the belt for any reason we only must unscrew the black part (galgue) and screw it flipped 180°. Due to the geometry explained above once we screwed the sheet metal which is holding the pulley moves forward and the tension is removed..

Disclosed by Niels Sánchez van den Beuken, Oscar Moya and Bartomeu Gaya, HP Inc.