

Automatic Door Handle Sanitizer Pair

Brief/Aim- To design a device which helps preventing spread of corona virus via frequently touched surfaces in offices, stores, and workplace areas (i.e. door handles). A design which is practical, affordable, simple to produce and can be easily cleaned.

Result

Designed an automatic door handle sanitizer which can be attached above door handles and filled with sanitizer. It sprays the sanitizer on the door handles when the doors are closed or opened.

Features achieved

Practical solution

Very cheap

Easy to produce by 3D printing (all parts of plastic and one spring)

Easy to clean

Universal application

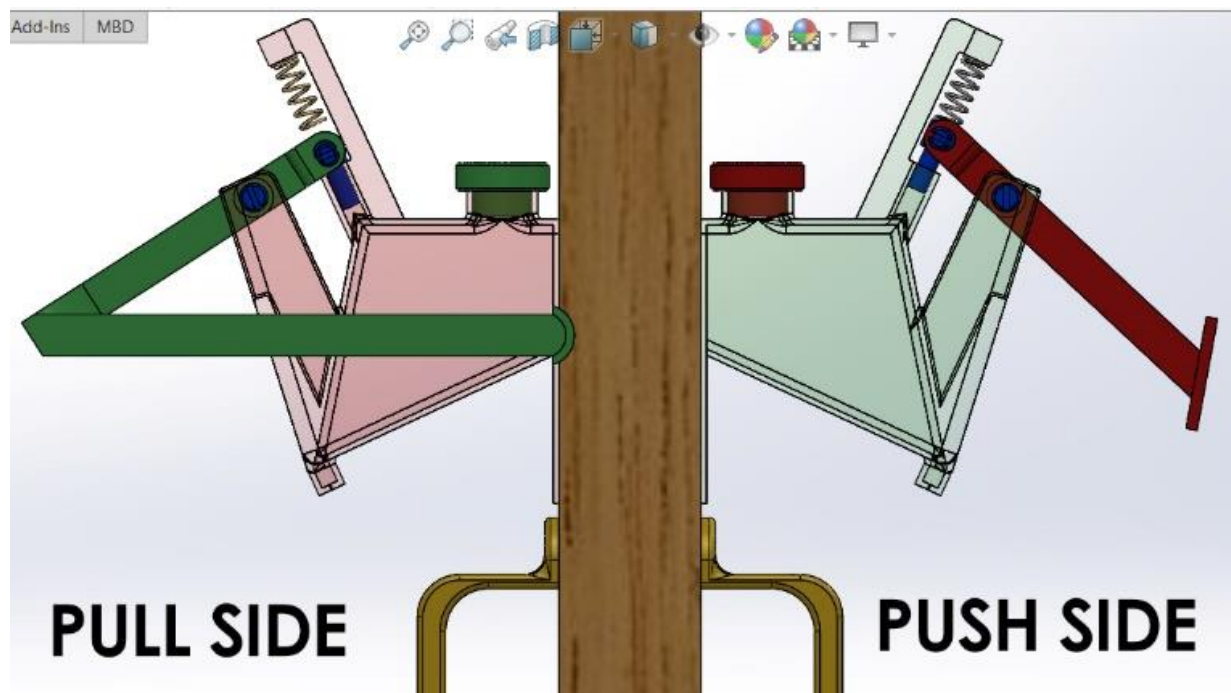
Robust

Zero electrical involvement

Construction

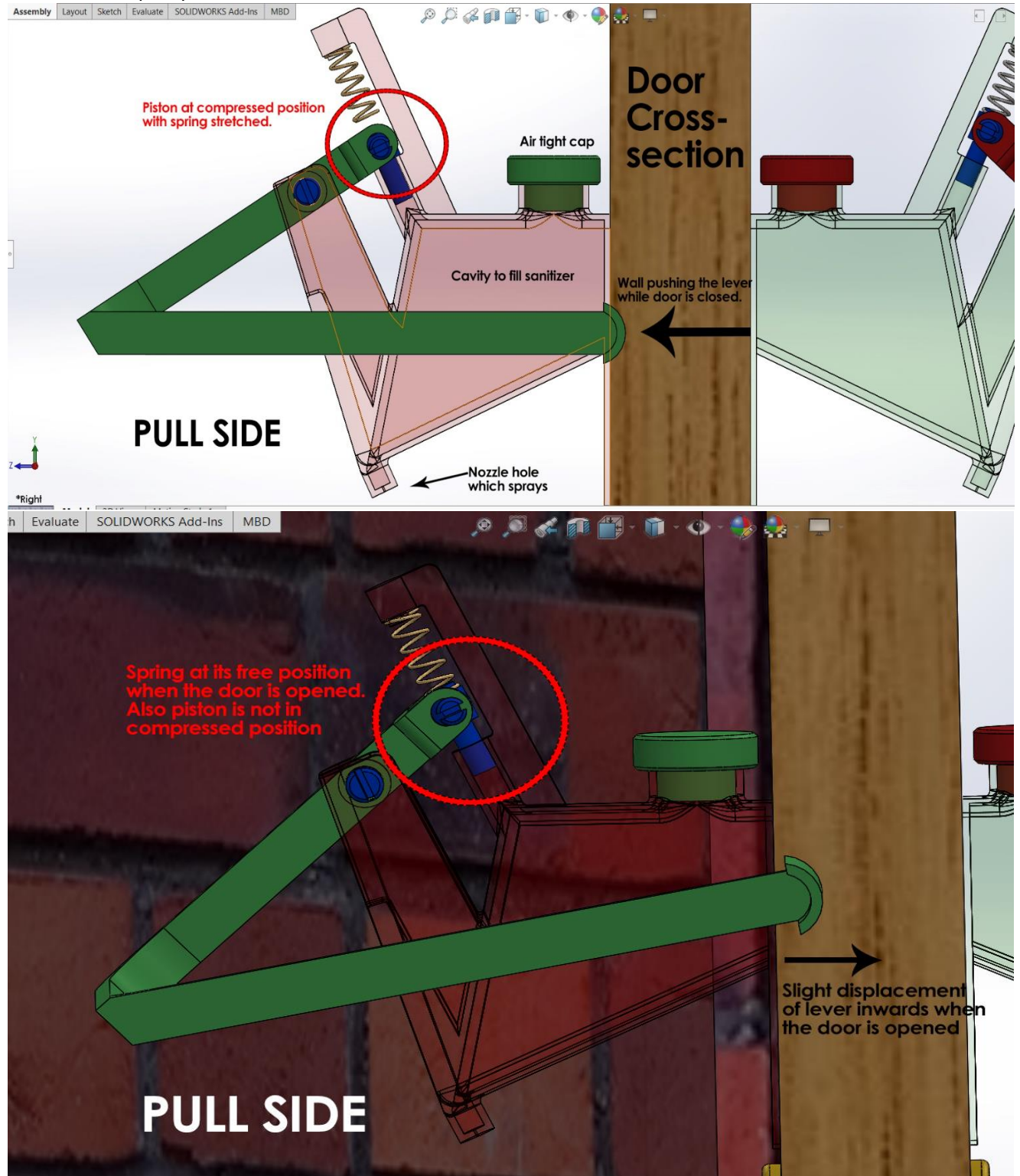
This pair consists of two same devices, one for the push side of the door and one for the pull side of the door, with the only difference being their actuating levers. They consist of an actuating lever, a spring, a 3D printed container body, a small piston and a cap for filling the sanitizer into it.

[Translucent material is applied to the main body only for the purpose of clear depiction]. ABS is recommended as material, but one can definitely try other materials as per availability. Springs can also be used as per availability until it gets the work done. This makes it a flexible and DIY product.



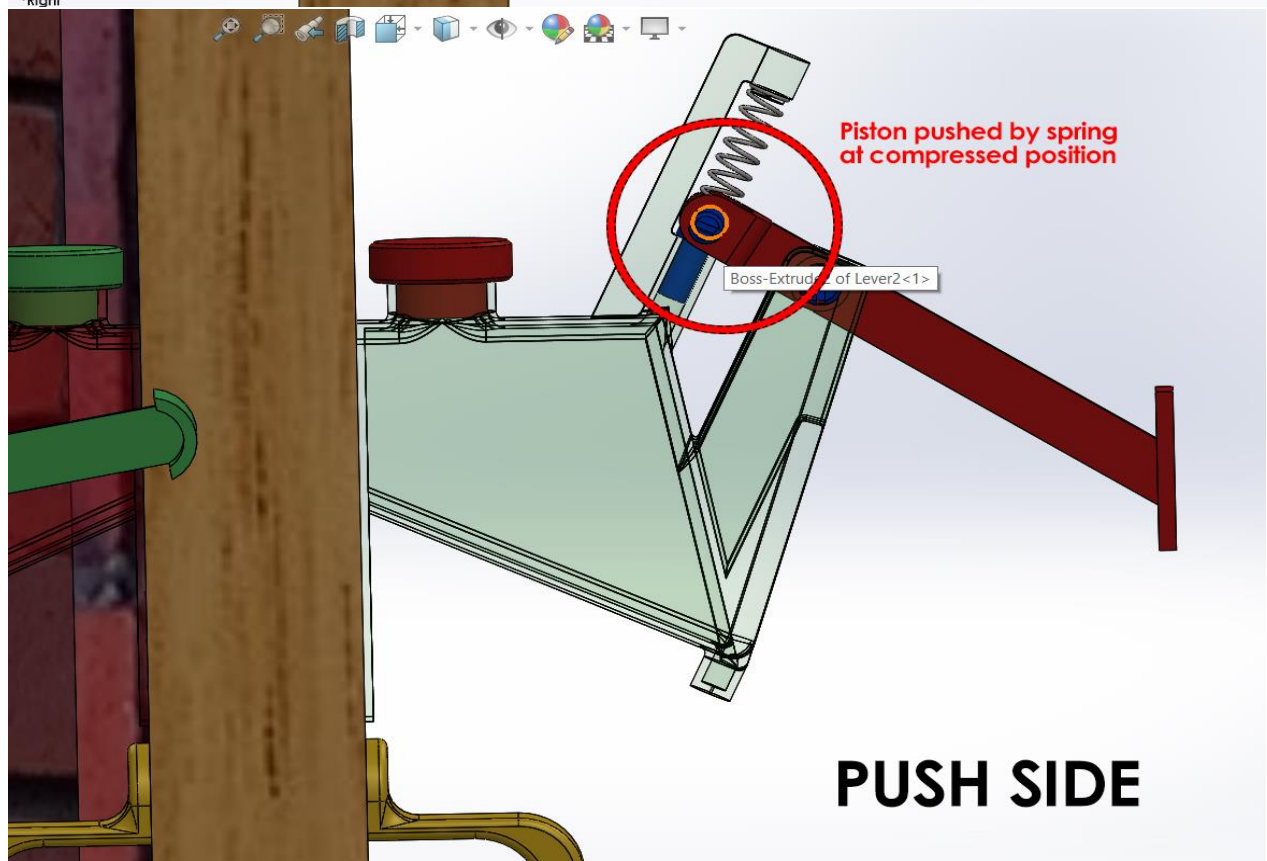
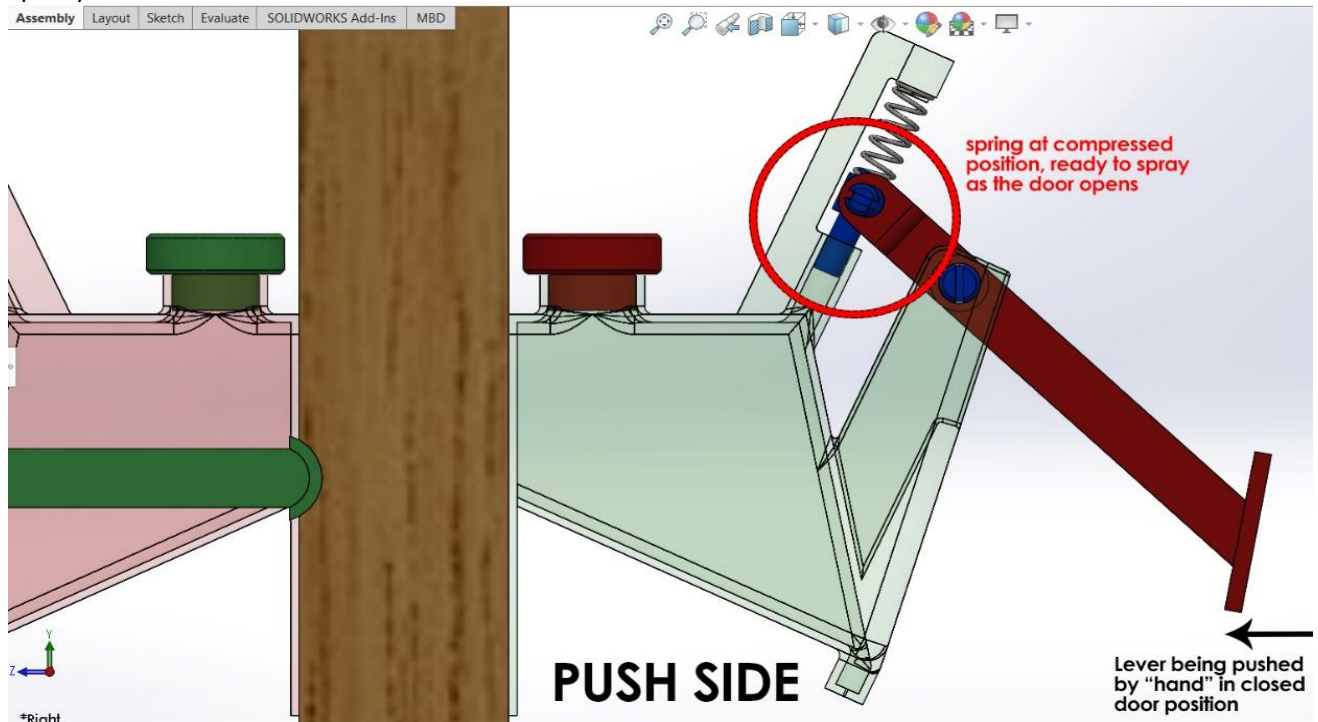
Working Pull Side

The initial position of this device's piston (while the door is open) is about 6.5mm above the compressed position with the spring holding it at that position against the lever. When the door is closed, the lever is pushed by the closing of door and the piston moves to the compressed position displacing more than 0.5ml of sanitizer volume. This sudden displacement causes the device to spray sanitizer over the door handle.



Push Side

The initial position of this device's piston (while the door is closed) is about 6.5 mm above the compressed position with the lever holding it at that position against the spring. When the door is opened, the contact with the lever is left, and the spring pushes the piston to the compressed position displacing more 0.5ml of sanitizer volume. This sudden displacement causes the device to spray sanitizer over the door handle.



Design Features

- Both the devices are attached on the door just above the door handle by any adhesive (or can even be screwed if there's a possibility). Push side requires the "Hand" to be attached on the wall near the door as shown in pictures.
- **Pull side** has 4 different plastic parts + 1 spring. **Push side** has 5 different plastic parts + 1 spring. The parts among both sides are exactly the same except the springs and levers.
- The lever in both the devices have been designed to triple the mechanical force at piston by leverage.
- Both the levers have been given 3 mm extra interference to avoid any loosening in future.
- The spring for **pull side** must have a free length (here 24.5mm) such that it can keep the piston 6.5mm above compressed position.
- The spring for **push side** must have a free length (here 31 mm) such that it can keep the piston at compressed position.
- Though the spring mounting area can easily be adjusted in CAD to compensate whatever spring one can arrange. Recommended wire dia. of spring is ~1mm.
- Holes are provided for firm spring mounting.
- The lever holes (joining with piston) have been given an extra 2mm allowance to compensate the extra joint required to change rotary motion into linear.
- All the allowances suitable for piston wall, cap wall, pins have been applied in the CAD model already. Though one can adjust them according to their 3D printer device.