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ASSEMBLABLE SPINDLE

HP INC

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Assemblable spindle

Abstract

Spindles are the most common accessory to load rolls of media onto large format printers.

Inserting a spindle into a media roll can sometimes be a challenge, especially when the media roll is long, eg longer than 36" or when the roll is new, meaning that it can be particularly heavy.

Regardless of how you load the roll on the spindle you need a clearance area around you, either the size of the spindle or that of the media roll.

This clearance area could be reduced to half and the loading process be simplified with a spindle consisting of two parts, as if the standard full-size spindle were cut in half, both parts being assembled back together either by a fastening or a clipping system.

This concept proves all the handier as the spindle is longer, eg 44" or 60".

Description of the Concept

Existing Solution

- Large format printer spindles generally look like Fig1, a long metallic pole with a built-in fixed disc on one end serving as a media roll stop and an open end on which you slide in/out an adjustable/removable part aka the hub or the cap (blue part in Fig1). The cap fits inside the core of the media on the other end of the roll and locks in the roll to the spindle.

New Solution

- The concept presented consists of splitting a spindle in half, leaving a fixed end and a cap end (Fig2); both components can be assembled back together thanks to either threaded ends (Fig3) or a button clip-based clipping system (cf violet tube on Fig4).
- The blue cap (Fig1) would remain as a separate item that is used to lock in the media roll into the spindle, just as it functions currently.

- There are two typical ways of loading media rolls onto a spindle: vertically and horizontally.
- Vertically: generally for media rolls shorter than 36" (Fig5)
    - With a standard spindle design:
        - The user holds the spindle vertically, the disc end against the floor

- The media roll is lifted until it can be inserted inside the cap end of the spindle – this can be quite challenging with long and heavy rolls and for short people.
- With an assemblable spindle:
  - The user still places the disc end of the spindle against the floor but as it is half the size of a standard spindle, the roll just has to be lifted half the height. The media is locked in due to the design of the fixed disc.
  - The user then inserts the cap end of the spindle on the top side of the roll and fastens (or clips) the two spindle parts together before inserting the removable hub.
- Horizontally: generally for media rolls longer than 40" (Fig6)
  - With a standard spindle design:
    - The user lays the media roll flat on a table and inserts the spindle in the core of the roll – this requires clearance around the table, the size of a media roll which can be up to 64".
  - With an assemblable spindle:
    - The user lays the media roll flat on a table and inserts the disc end of the spindle.
    - Then inserts the cap end on the other side of the roll and fastens the two spindle parts together (or clip them) – the clearance area around the table is reduced by half and the handling of shorter spindle components improves usability.
    - As the spindle disc is not round, the weight of the media roll applies a force on the disc end against the table which will allow the user to fasten both spindle parts tightly.
- This new system simplifies the task of changing media for all users by making it more versatile and by reducing the space needed to load a roll both in vertical and horizontal loading positions.

Threaded ends are common in the industry and are probably a more reliable option to industrialise and manufacture than the clipping option.

Fig1 - Large format printer spindle

Cap end

Disc end

Fig2- The two components of the large format printer assemblable spindle

Fig3 - Threaded ends to assemble both spindle components

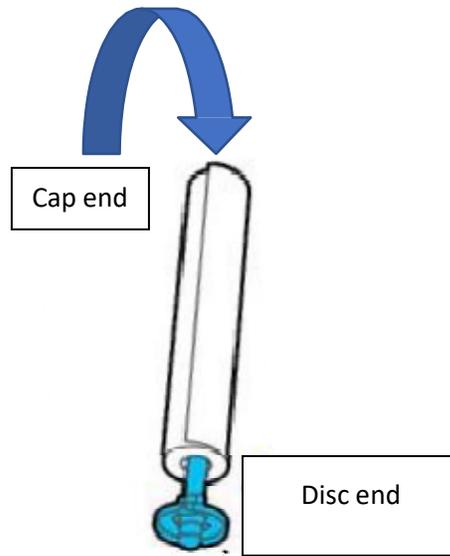Fig4 - Example of button clip-based clipping system to assemble both spindle components

Cap end

Disc end

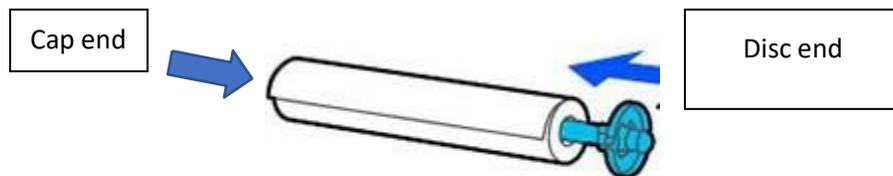Fig5 – vertical insertion of the two spindle parts into the media roll

Cap end

Disc end

Fig6 – horizontal insertion of the two spindle parts into the media roll

Disclosed by Alex Bernaus and The-Hien Trinh, HP Inc.