

Technical Disclosure Commons

Defensive Publications Series

February 2020

IMAGE FORMING APPARATUS USING FRAMELESS MOTOR

HP INC

Follow this and additional works at: https://www.tdcommons.org/dpubs_series

Recommended Citation

INC, HP, "IMAGE FORMING APPARATUS USING FRAMELESS MOTOR", Technical Disclosure Commons, (February 07, 2020)

https://www.tdcommons.org/dpubs_series/2942



This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/).

This Article is brought to you for free and open access by Technical Disclosure Commons. It has been accepted for inclusion in Defensive Publications Series by an authorized administrator of Technical Disclosure Commons.

1. Title

Image forming apparatus using frameless motor

2. Abstract

The rotating body in the image forming apparatus having a sensitive effect on noise / vibration is driven by a frameless motor. By connecting directly parts between the motor and the rotor, it is possible to minimize the error of rotational speed, image defect and acoustic noise caused by the accessories.

3. Description

Conventionally, in order to drive the rotating body (Ex. OPC Drum) in the image forming apparatus, a driving unit connected with gears and couplers from the power source (motor) to the rotating body was required as shown in Fig. 1. However, the transmission efficiency error is minutely generated due to the connecting parts except the driving power source and the actual rotor, which causes image defects such as Image Jitter / Band / Color Registration and driving acoustic noise.

As shown in Fig. 2, power transmission elements (gear, belt, etc.) in the driving unit of the image forming apparatus were removed by using a direct drive motor. With direct drive system, less noise/vibration rotating device was realized, and long life and lower cost driving device could be realized by removing gear wear factor.

However, the coupler was essentially used when the motor and the rotating body (Ex. OPC Drum, intermediate transfer belt unit) were connected. The coupler made some defects such as the color registration miss matching and the image band of the paper running direction.

This invention which is directly connecting the power source consisting of the stator and the rotor without the frame and shaft as shown in Figure 3. can reduce the various defects caused by the error of the accessory parts (Gear, Pulley, Belt, Shaft, etc.). In addition, as shown in Figure 4, the installation space of the driving unit can be significantly reduced to maximize design freedom of the image forming apparatus, and the material cost reduction effect can be secured by reducing the

number of unit parts. By not using essential lubricants in the gearing configuration of the drive unit, the decreasing of durability due to gear wear could be eliminated and the maintenance cost reduction could be expected.

Disclosed by Hakkyum Kim, Hyoungil Kim, Youngjum Shim, Sungdae Kim and Sangbum Woo, HP Inc.

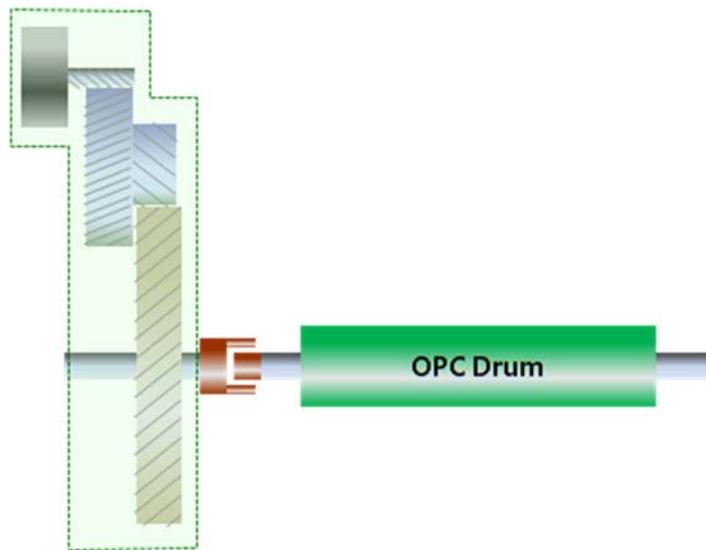


Fig 1. Conventional Geared Drive System

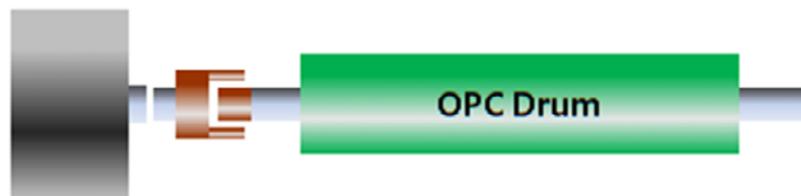


Fig 2. Direct Drive System

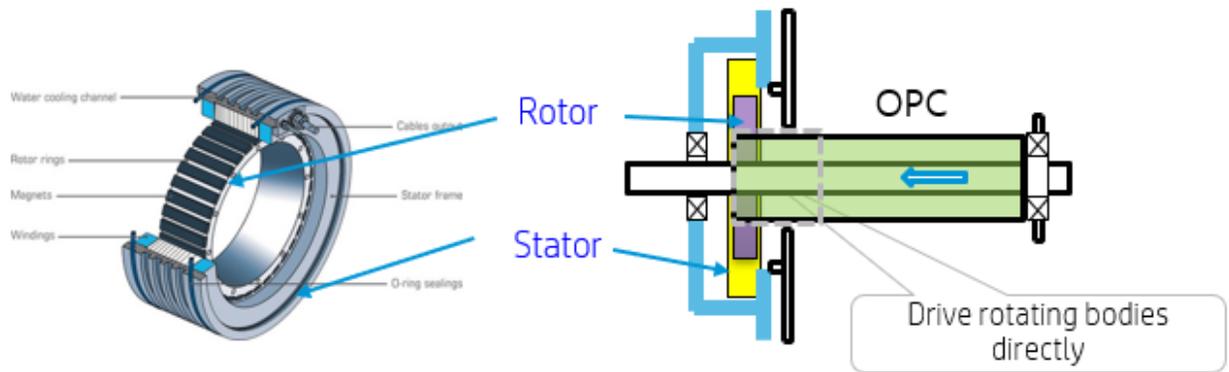


Fig 3. Frameless Direct Drive System

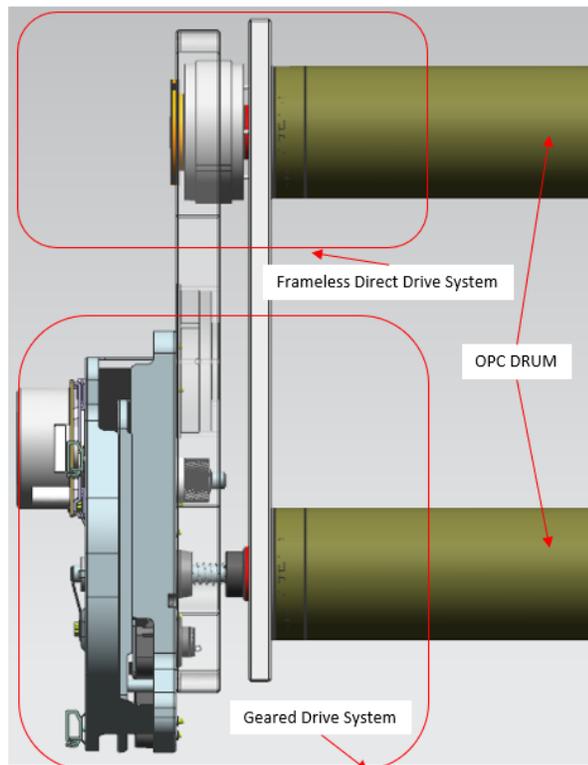


Fig 4. Geared Drive System vs. Frameless Direct Drive System