Journal of Multidisciplinary Engineering Science and Technology (JMEST)
ISSN: 2458-9403
Vol. 8 Issue 10, October - 2021

Research On Cleaning And Tidying Up The Heating Group Of The Business Machine

Shih-Ping Hu
Department of mechanical engineering
Hungkuo Delin University of Technology
New Taipei City, Taiwan, Republic of China
hushihping@yahoo.com.tw

***Abstract*—When the business machine (photocopier) is operating, the scanner takes the manuscript and transfers the image and the text to the monitor. The heating group of the business machine heats the toner and prints it on a new blank drawing paper. The structure of the heating group of the business machine is very complicated and delicate. After using this mechanism for a long time, it is easy to trap impurities, which makes the quality of the subsequent printed products very poor (easy to blur in black and white). Because business machines (photocopiers) are used very frequently, then many situations that are listed above often occur (house meals). In view of this phenomenon, after dismantling the heating group of the business machine, the electrostatic dust collection equipment was used to cleverly absorb the toner remaining on the heater. Here "very cleverly" is the skill of the technician. This skill requires years of practice and it is difficult to describe in words.**

Keywords—scanner, displayer, usage frequency, electrostatic dust collection equipment.

I. Introduction:

The layout and composition of the heating group that is built in the business machine can be divided into several parts in total. ①paper exit unit ②fusing unit ③duplex unit ④waste toner unit ⑤power control and distribution unit ⑥image transfer unit ⑦air flow system ⑧operation board and switch ⑨paper path unit.

Above devices are the most likely to be contaminated by the waste toner. The technician must find a way to clean it anytime and anywhere in order to maintain the high quality of the office machine (the photocopy product is black and white, and is never confused).

II. Method of cleaning and tiding up

Although the transmission factor of the internal pollution in the business machine is the toner, then it is necessary to relay on the toner to print the manuscript of the scanner. So for the business machine, the success is also the toner, the failure is also the toner. The internal structure of the business machine is very complicated. Because the degree of pollution of each devices in the business machine are different, therefore cleaning method of each devices are also different.

(1) The focus of the paper exit unit is on the dirt at the exit.

(2) The focus of the fusing unit is the removal and the cleaning of the dust cover.

(3) The cleaning method of the duplex unit is to use a vacuum cleaner to suck the toner instead of wiping with a damp cloth.

(4) The cleaning method of the waste toner unit is to diligently replace the waste toner cartridge and clean and dry it.

(5) The cleaning method of the power control and the distribution unit is to replace the dust cover of the electric circuit line and don't contact with moisture to avoid missing power.

(6) The image transfer unit: Because this unit has very little chance of being contaminated by the waste toner, therefore it can only be blown off with a hair dryer.

(7) The cleaning method the air circulation system is to disassemble the air filter and clean it.

(8) The cleaning method of the operation board and the switch is to wipe with a wet wipe and blow dry with a hair dryer.

(9) For the paper path unit, it cover a very wide range, the most detail structure, and the least easy to clean. It can be wiped with a wet wipe, but the wet wipe should be changed frequently.

III. Ways to implement technology transfer

3.1 The introduction of the overall business Machine

Fig. 1 The appearance of the business machine

3.2 The position of heating group on a business machine.

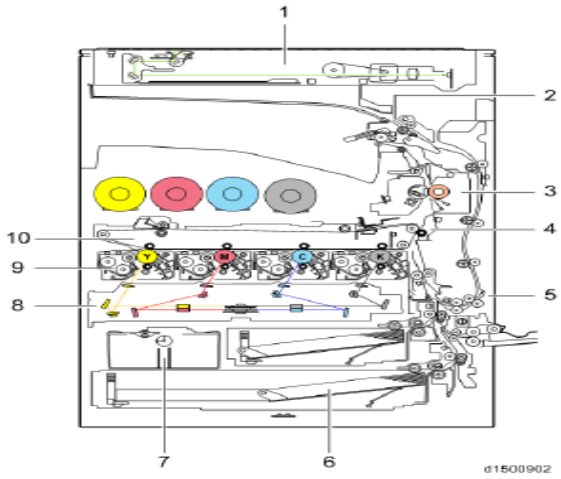

Fig. 2 The position of heating group

In Fig. 2, "2" represents paper unit, "3" represents fusing unit, "5: represents duplex unit, "7" represents waste toner unit, "9" represents power control and distribution unit, "10" represents image transfer unit.

3.3 Detail diagrams of other heating groups

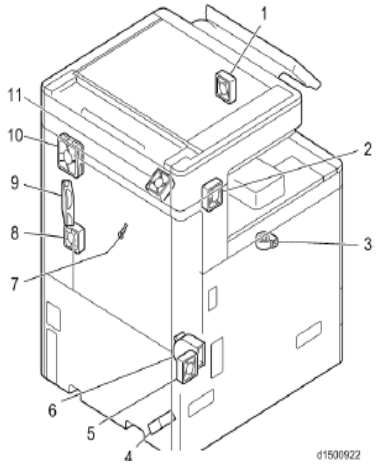

Fig. 3 The air circulation system

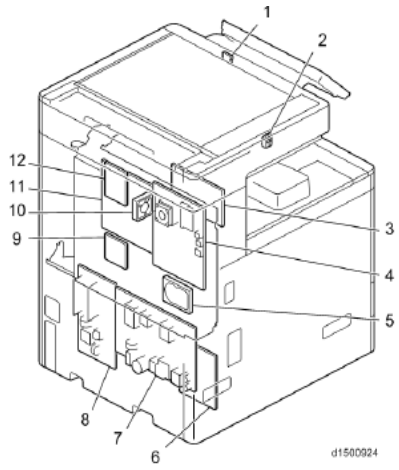

Fig. 4 The operation board and switch unit

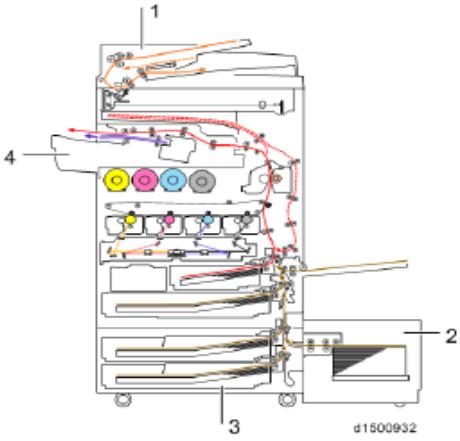

Fig. 5 The paper path unit

IV. Results of technology transfer

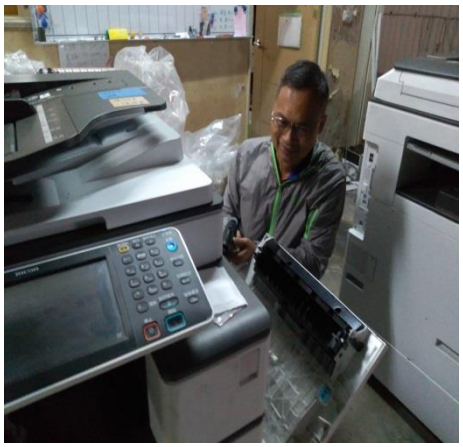

Fig. 6 detecting the fusing unit of heating group

Fig.7 detecting the air circulating system of heating group

Fig.8 The heating group that has been detected

V.Conclusion:

For the heating group built in the business machine: Compared with the old business machine, the new business machine has the following improvements:

5.1 On the detection (specific sensor) of

the paper tray of the new model: “The operating touch of taping on the long gauge paper size position”. This makes cleaning and maintenance much more convenient and very time-saving.

5.2 On the issue of the fusing unit, the use

of metal single purpose grease to replace the traditional plastic purpose grease saves a lot of time in the cleaning and finishing of the fusing unit.

5.3 On the problem of duplex units, the use

of side fence set assist function can reduce the flying of waste toner, which helps to recover waste toner and can reduce the time and effort required by technicians to clean and tidy up.

5.4 On the air circulation system, the

Temperature is controlled at 10^0C~32^0C (50^0F~90^0F) and the relative humidity is controlled within the range of 15%~18%, which can prevent the waste toner unit from flying around and reduce the burden on the technicians and save time.

VI. Reference:

[1](2015), "*service manual of Rich University Learning, knowledge, performance*", page 1-1~1-44, Ricoh Americas corporation, 1st edition.

[2]Wong Z.C., (1999), "Research on dismantling and recycling of waste toner cartridge", master's dissertation; Tainan, Taiwan, national Cheng Kung university, department of resource.

[3]Wong J.X., (2009), "Research on improving the service performance of multi-function business machine service staff", master dissertation, Changhua, Taiwan, national Changhua normal university, department of information management.