TOSHIBA MJ-1015 MJ-1016 FINISHERS – LET'S "FINISH" THE COPY/PRINT JOB (part VI)

By **VLADIMIR KAMENOV**

Here is the continuation of the series of articles about Toshiba MJ-1015 MJ-1016 finishers. In the 2009 February, March, April and May issues of RechargEast Magazine you will get acquainted with the operation principles and description of saddle stitch and punch units in these Toshiba copiers.

The previous articles were published in RechargEast Magazine in October, November, December and January issues. These issues are available upon request. Please forward your requests for past issues of the magazine to nikolai@rechargeast.com

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C. CONTROLLING THE MOVEMENT OF SHEETS

When the leading edge of a sheet has moved past the inlet flapper, the intermediate feed roller and the crescent roller start to move the sheet forward.

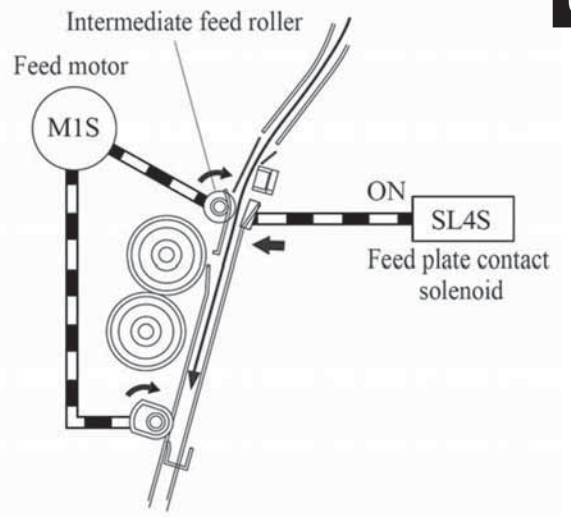
The intermediate feed roller is normally not in contact with the path bed. When the leading edge of a sheet reaches the intermediate feed roller contact section, the feed plate contact solenoid (SL4S) causes the roller to come into contact with the path bed so as to move the sheet. The contact is broken as soon as the leading edge of the sheet reaches the paper positioning plate. This series of operations is executed each time a sheet arrives.

When the leading edge of the first sheet reaches the paper positioning plate, the paper positioning plate paper sensor (PI8S) is turned ON. The arrival of the second and subsequent sheets will not be checked since the first sheet will still be over the sensor.

The crescent roller keeps rotating while sheets are being output, butting the leading edge of each sheet against the paper positioning plate, and ultimately, keeping the leading edge of the stack in order. The alignment motor (M5S) drives the alignment plates for each sheet so as to put both left and right edges of the sheet in order.

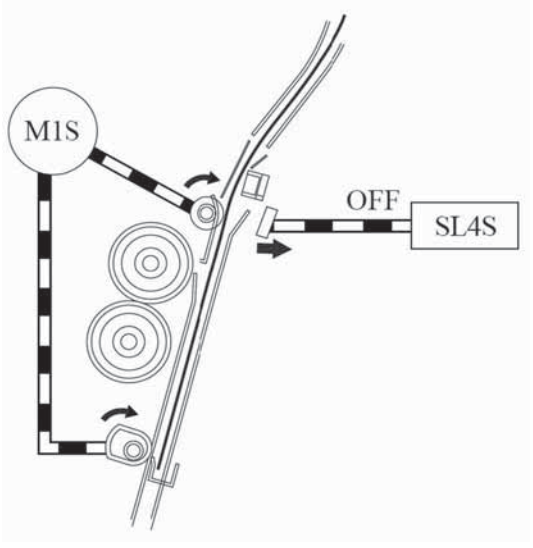
I) The solenoid is turned ON while paper is being moved so that the feed plate comes into contact:

01



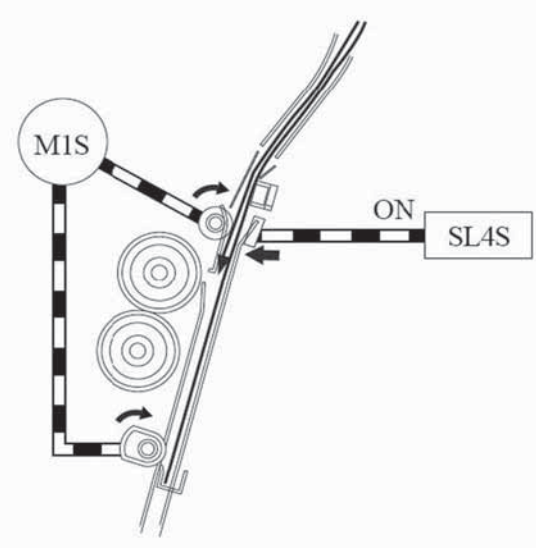
2) The solenoid is turned OFF when the paper buts against the paper positioning plate. The feed motor continues to rotate:

02



3) The solenoid is turned ON when the next sheet arrives and the feed plate comes into contact.

03

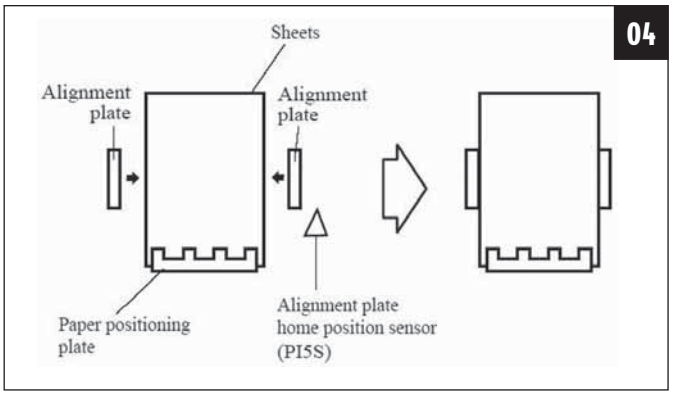


D. ALIGNING THE SHEETS

The alignment motor (M5S) drives the alignment plates each time a sheet is output, putting both left and right edges of the sheet in order. The alignment motor is a 4-phase stepping motor. The position of alignment plate is identified in reference to the number of motor pulses from the alignment plate home position sensor (PI5S). The following briefly describes what takes place when the saddle stitching mechanism operates on two sheets.

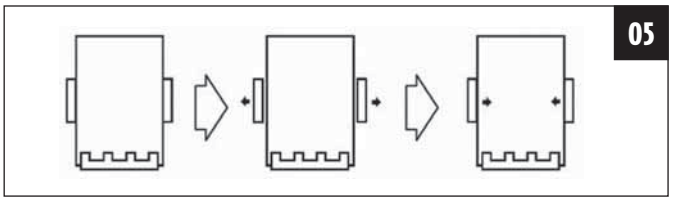
1) When the first sheet has been output, the alignment plates butt against the left and right edges of the stack (first alignment). The alignment plates leave the home position in advance and remain in wait at points 10 mm from the edges of the stack:

04



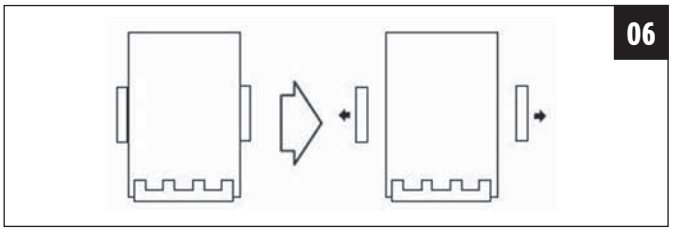
2) The alignment plates move away from the edges of the stack over a short distance and then butt against the edges once again (2nd alignment):

05



3) The alignment plates escape to points 10 mm from the edge of the stack:

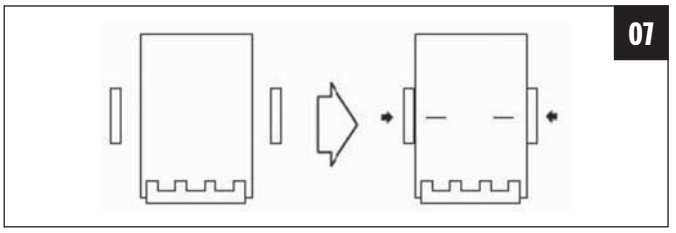
06



4) When the following stack arrives, steps 1 through 3 above are repeated.

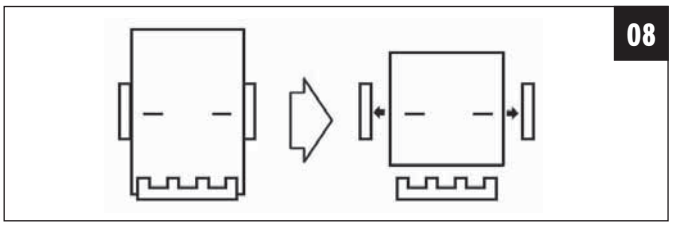
5) The alignment plates butt against the stack once again, during which stitching takes place:

07



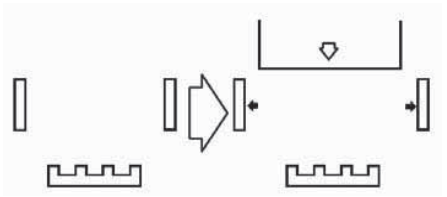
6) The alignment plates escape to points 10 mm from the edges of the stack, after which folding and delivery take place:

08



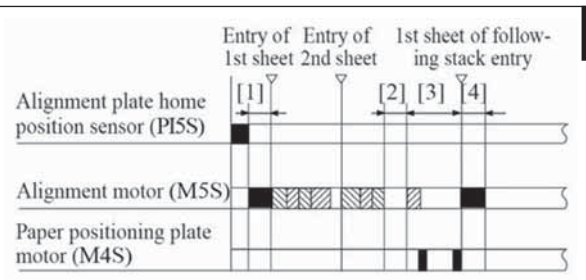
7) When the first sheet of the following stack reaches the No.1 paper sensor, the guide moves to a point 10 mm from the edge of the stack to be ready for the next alignment operation:

09



In case of 2 sheets:

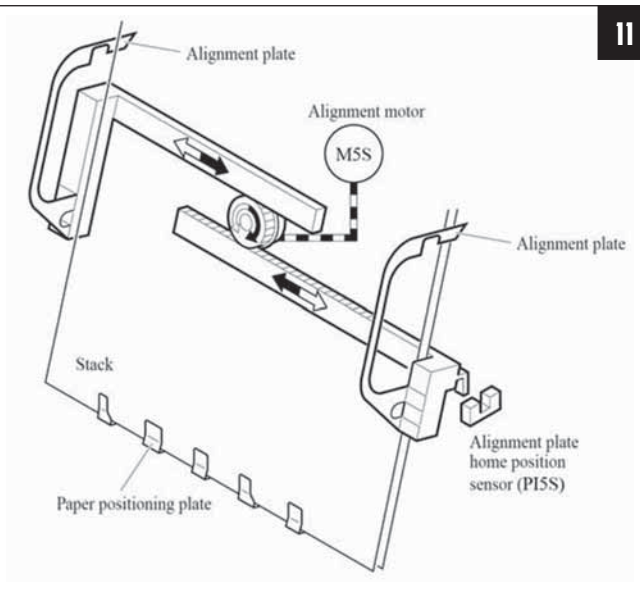
10



: Alignment : Escape

where:
[1]: Move to wait position
[2]: Stapling period
[3]: Paper folding/delivery period
[4]: Move to following stack size wait position

11



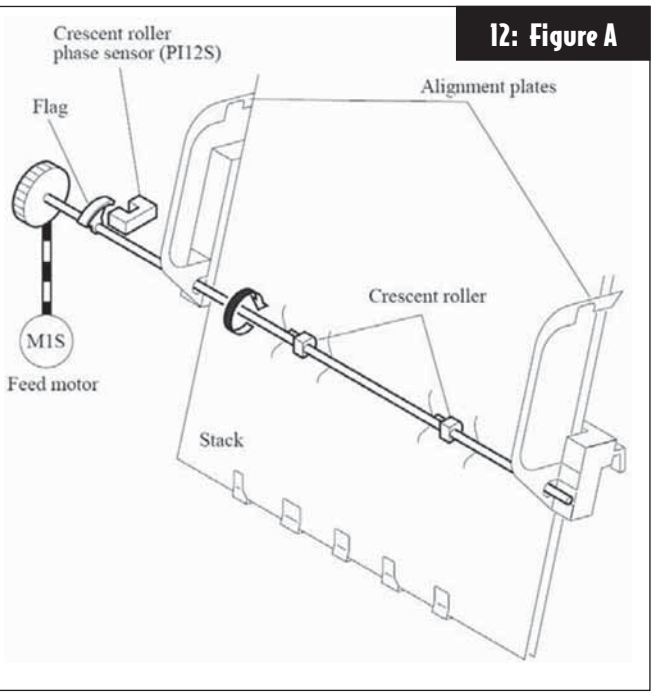
E. CONTROLLING THE PHASE OF THE CRESCENT ROLLER

1. Outline

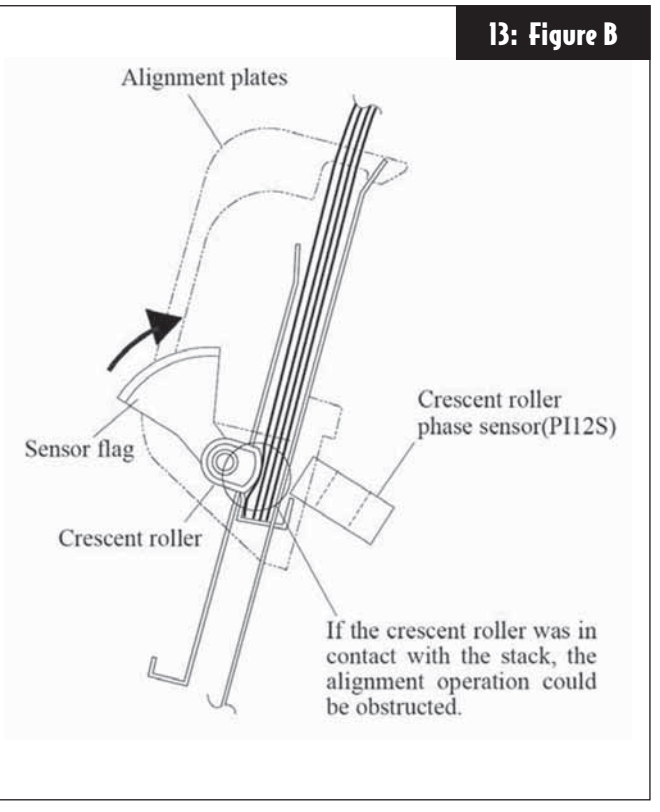
If alignment was executed with the crescent roller in contact with the stack of sheets, the resulting friction against the roller causes the stack to move inappropriately (Figure A).

To prevent this problem, the phase of the roller is identified and used to determine the timing of alignment. The phase of the crescent roller is identified by the crescent roller phase sensor (PI12S). The flag for the crescent roller phase sensor is mounted to the crescent roller shaft. The flag will leave the sensor while the roller shaft rotates, turning the sensor ON or OFF, enabling the assumption that the crescent roller is positioned at the opposite side of the stack (Figure C). The alignment plates are operated to correspond with this change in the state of the sensor.

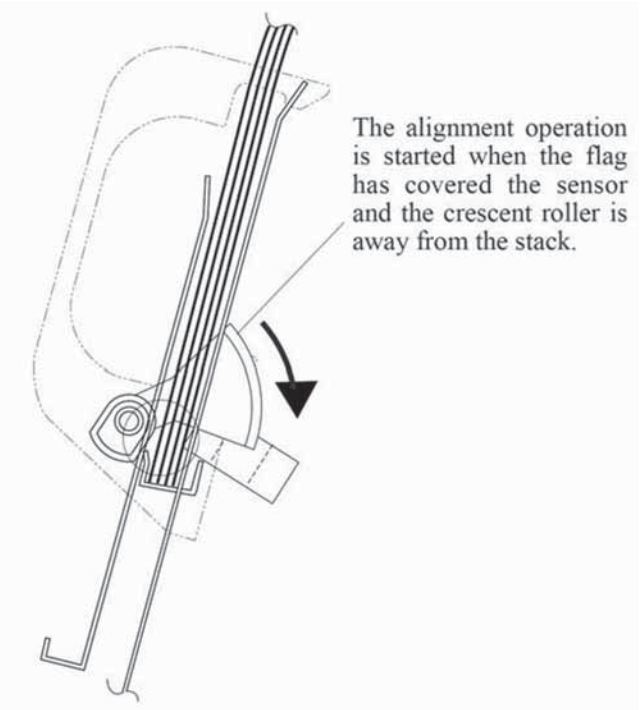
12: Figure A



13: Figure B



14: Figure C



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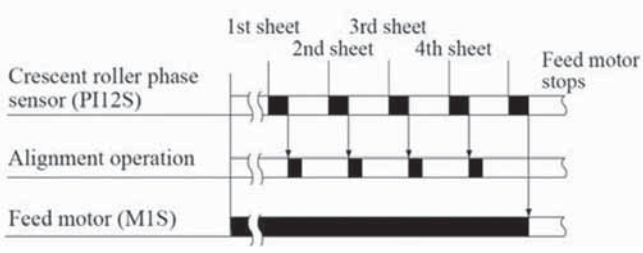


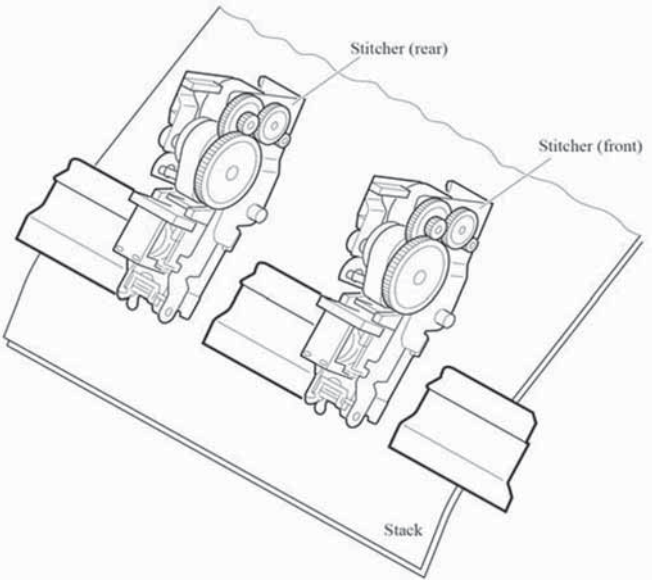
IV. STITCHING SYSTEM

1. Outline

The stitching system "stitches" the center of an output stack with staples. To enable stitching at two locations on a stack, two stitcher units (front, rear) are used. Each stitcher unit is equipped with a stitcher motor (M7S, M6S) for drive, a stitcher home position sensor (MS7S, MS5S) for detection of position and a staple sensor (MS6S, MS4S) for detection of the presence/absence of staples.

The stitcher base is designed so that it may be drawn out to the front from the saddle stitcher for replacement of the staple cartridge or removal of a staple jam. The stitcher unit in sensor (PI16S) is used to make sure that the stitcher base is properly fitted to the saddle stitcher. Safety switches are not mounted for the stitcher unit (front, rear), as the location does not allow access by the user:

16

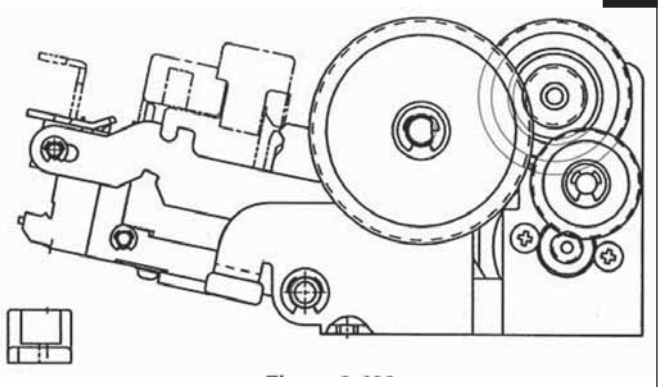


2. Stitcher Unit Operation

The stitcher base unit consists of two stitchers and stitcher bases. The stitchers are fixed in position, and are not designed to slide or swing. Stitching is executed by driving the rotary cam by the stitcher motor (M7S, M6S). The front and rear stitcher units are operated with a time delay so as to prevent wrinkling of paper and to limit the load applied to the power supply. (A time delay for initiating the stitcher motor startup current helps decrease the load on the power supply.)

The stitcher home position sensor (MS7S, MS5S) is used to monitor the movement of the rotary cam, enabling identification of individual stitcher operations. The presence/absence of staples inside the staple cartridge fitted to the stitcher is detected by the staple sensor (MS6S, MS4S). The alignment plates keep both edges of the stack in place while stitching takes place:

17



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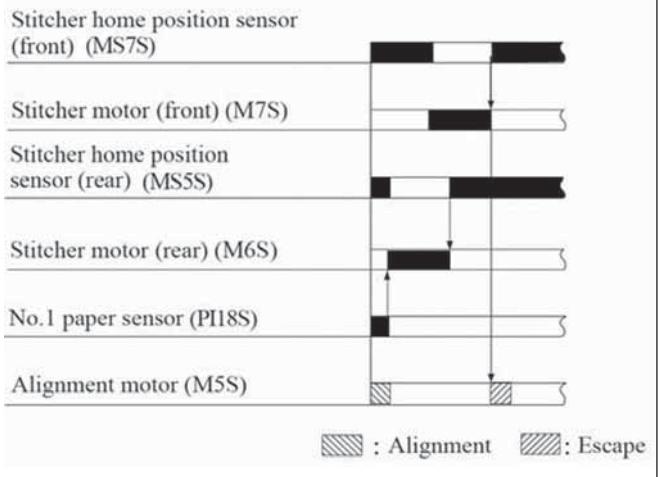

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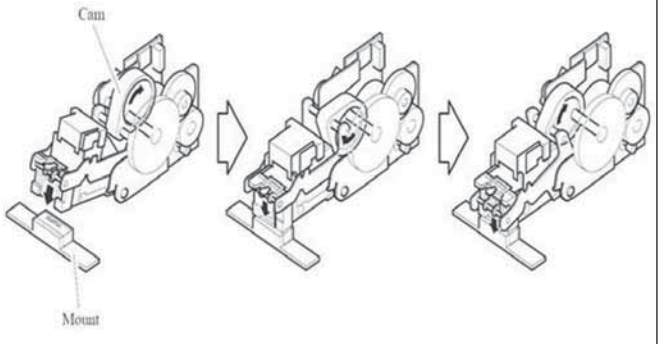

To be continued.

Read in the April issue of RechargEast Magazine:
--> Folding/delivery system RCE