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A METHOD OF SAD ALIGNMENT OF NOZZLES IN THE WEAVING ZONE BETWEEN TWO STAGGERED PHs

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Title:

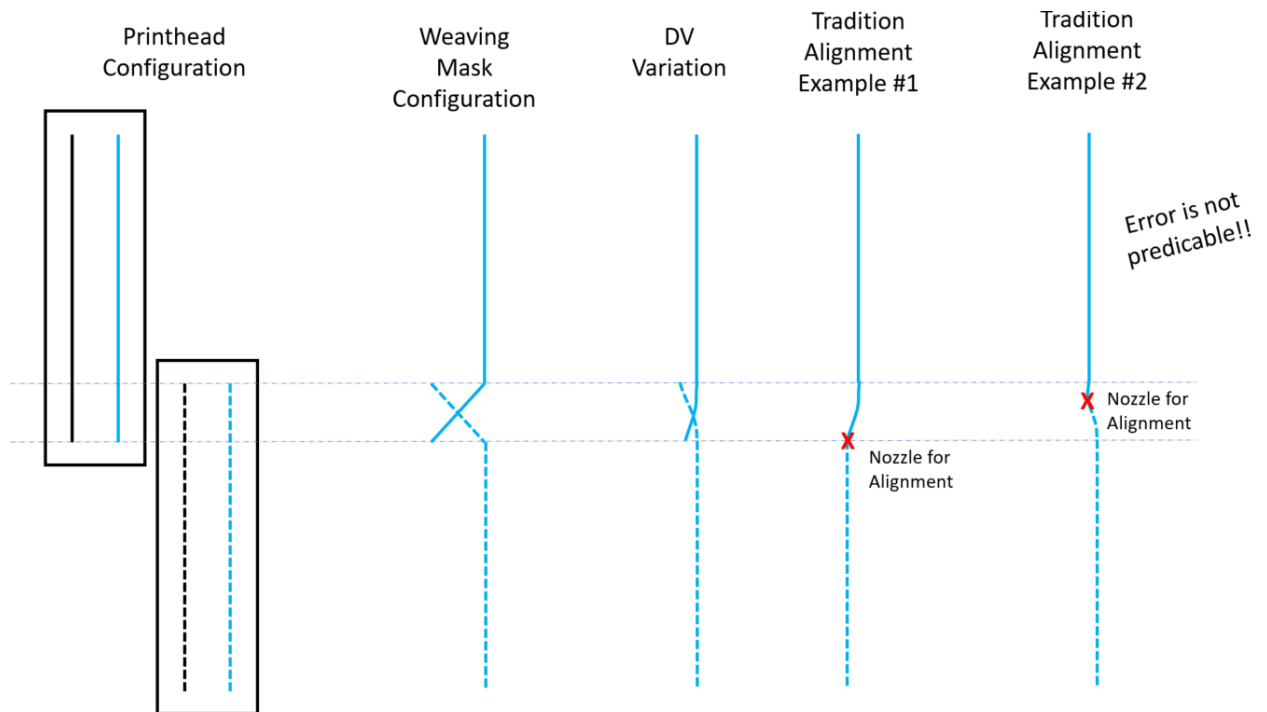
A method of SAD Alignment of Nozzles in the Weaving Zone between two Staggered PHs

Descriptions:

Printers with either TIJ or PIJ PHs all face with the limitation of size of dies due to manufacturability of the dies. To be able to have higher productivity in the printer, staggering PHs is a financial effective solution. When using staggering configuration, how to use nozzles in the weaving zone (the overlap area shared between two Staggered PHs) can be an inevitable problem.

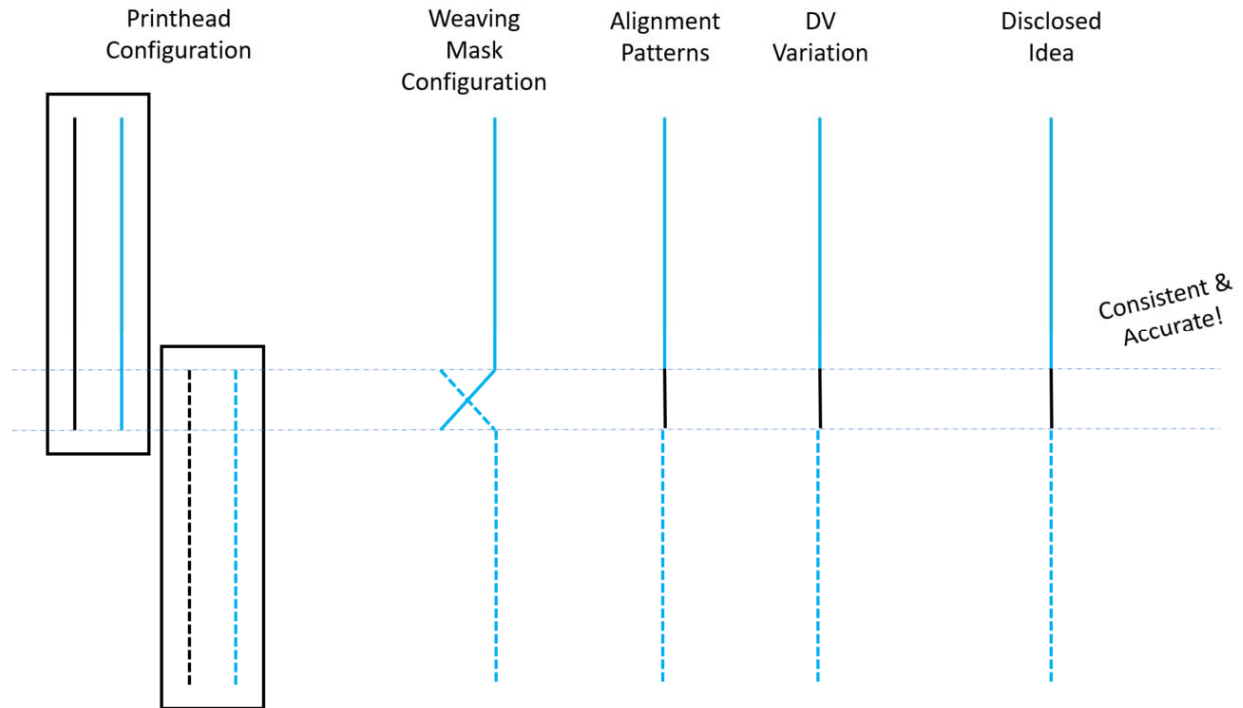
The uneven usage of nozzles in the weaving zone comparing with the non-weaving zone nozzles can have different drop velocity due to uneven kogation/oxidation at the resistor level. On top of that, for some non-Newtonian ink, the drop velocity can be different when firing with different FF.

Scan axis alignment is important in this condition. The traditional method of alignment is done by using nozzles from two PHs of the color needs to do alignment within a specific nozzle region. Due to different drop velocity degradation due to above causes, the error can be unpredictable.



The idea disclosed here aims to turn this unpredictable error to a consist and accurate alignment.

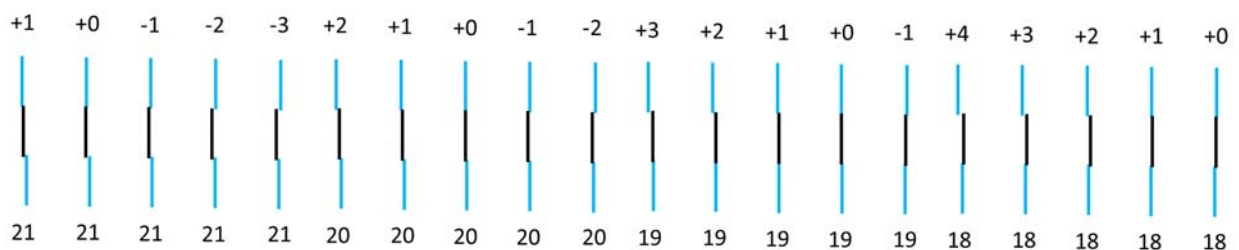
Alignment with the Robust Ink



The key innovative points are

- Using another color which is more reliable in the weaving zone.
- Align both PHs to the same weaving zone color line which is robust in terms of drop velocity.

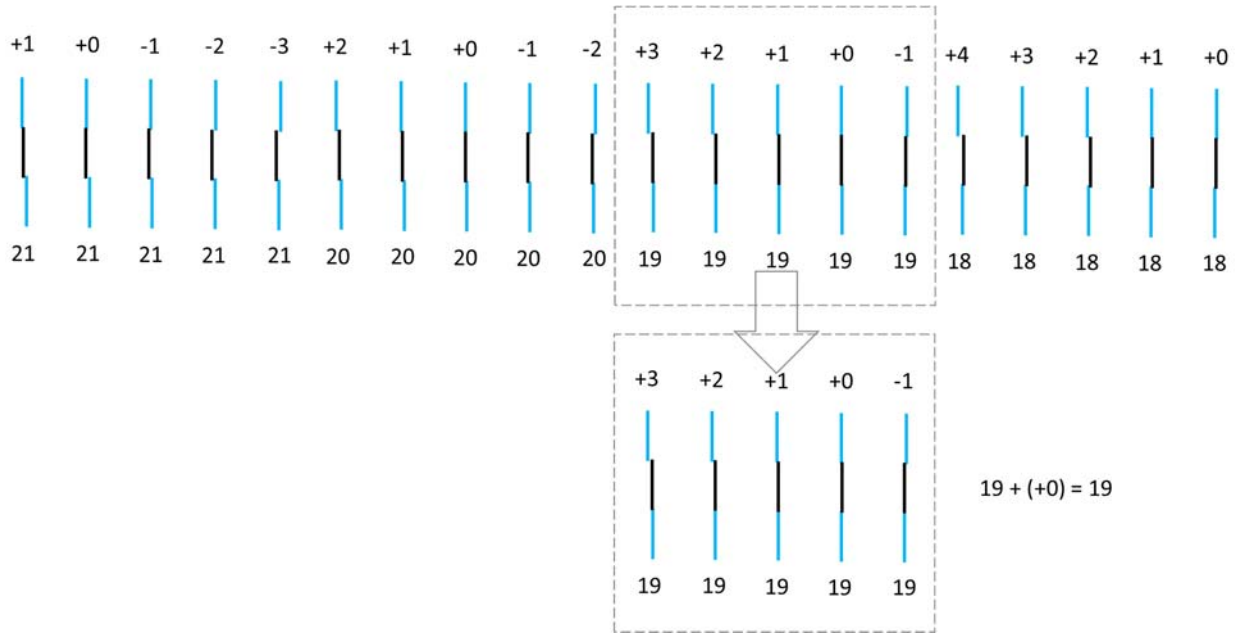
Print patterns as following



- A. Print the alignment patterns (line patterns) from the drop velocity sensitive ink of one PH using the nozzles from non-weaving zone attached to the weaving zone.
- B. Print the alignment patterns (line patterns) from the drop velocity sensitive ink using of the other PH using nozzles from non-weaving zone attaches to the weaving zone. The spacing between line patterns is one pixel wider than previous line patterns A.
- C. Print the alignment patterns (line patterns) from the drop velocity insensitive ink from the weaving zone. The spacing between line patterns is the same as pattern A.
- D. Duplicate group of A, B and C pattern by offsetting C pattern laterally for -2, -1, 0, 1, 2 pixels.

How to use the alignment patterns?

- Look for the group of Pattern D which aligns better A and C. Pick the number aligns better.
- Within Pattern D, look for the line which aligns better B and C. Pick the differentiation value aligns better.
- Sum the number and differentiation value. It will be the final value used for alignment between two staggered PHs using drop velocity sensitive ink.



Disclosed by Li Qian, Maxime Rosello and Xavier Quintero Ruiz, HP Inc.