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54 **Multiple ink jet print cartridge alignment method.**

57 An improved media axis image registration system for a multi-color inkjet printer/plotter (10). The inventive system comprises a carriage assembly (100) for retaining multiple inkjet cartridges (102, 104, 106, 108) or pens. Each cartridge (102, 104, 106, 108) has a plurality of nozzles (502, 504, 506, 508) adapted to eject ink in response to the application of an electrical signal thereto. A first mechanism (112) is provided for moving the carriage assembly (100) in a first (scan) axis. A second mechanism (152) is provided for moving print media (30) in a second (media) axis transverse to the first axis. A position encoder (152) senses the position of the carriage assembly in the media axis. A control circuit (300) provides electrical signals which cause the nozzles (502, 504, 506, 508) in the inkjet cartridges (102, 104, 106, 108) to eject ink onto the media (30) and create an image thereon in the form of a test

pattern (40) in response to timing signals. The inventive system includes a sensor module (200) which optically senses the image and provides a set of sensed signals in response thereto. The sensed signals are sampled in accordance with position encoder signals to provide corrected timing signals. In a particular embodiment, the test pattern (140) is illuminated by a light source (232) in the sensor module (200). The light source (230) has spectral energy in the color bands of interest. The test pattern (40) includes a plurality of vertically spaced bars which, when scanned by the sensor module (200), allow the module (200) to generate an output signal of a given frequency. The output signal is sampled and processed to provide the corrected timing signals for activation of the nozzles. By detecting the position of the pattern (40), the misalignment of a particular pen may be corrected.

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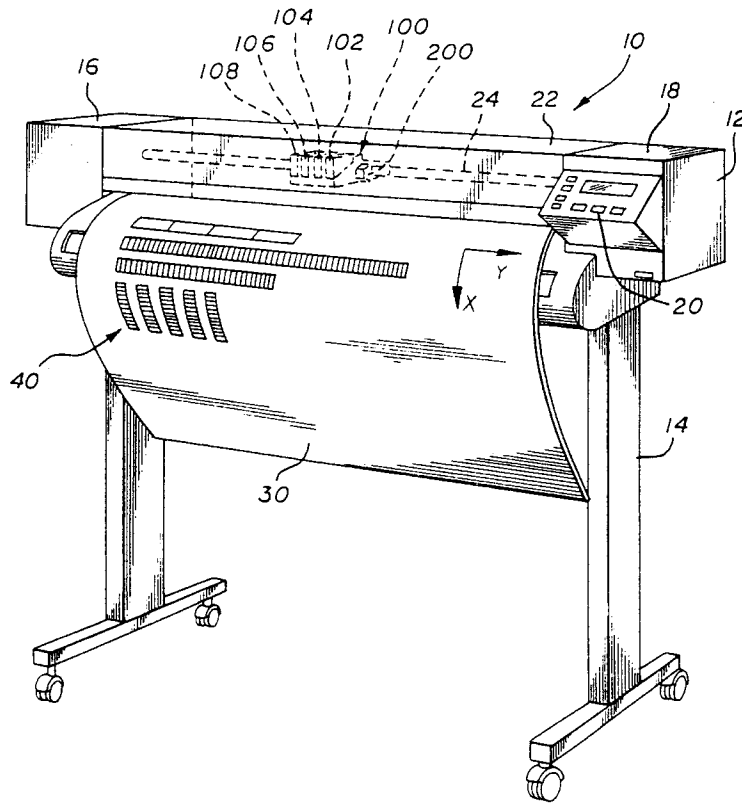


FIG. 1



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
D,P, X	EP-A-0 540 244 (HEWLETT-PACKARD COMPANY) * the whole document * ---	1-4	B41J25/34 B41J2/21
X	US-A-4 449 052 (KRIEG) * claim 1; figure 1 * ---	1,2	
P,X	CH-A-681 929 (MUENGER, K.) * claims 1,2; figure 1 * ---	1,2	
X	PATENT ABSTRACTS OF JAPAN vol. 16 no. 208 (M-1249) ,18 May 1992 & JP-A-04 033861 (CANON INC) 5 February 1992, * abstract * ---	1	
A	US-A-4 183 659 (BRUNNER) * the whole document * ---	1-9	
A	EP-A-0 452 157 (CANON KABUSHIKI KAISHA) * column 5, line 23 - column 6, line 1; claim 5 * -----	1-9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			B41J G06K
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 June 1995	Examiner Joosting, T
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	