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(72) Inventor: **Johnson, David A.**
Boise, Idaho 83713 (US)

(74) Representative:
Liesegang, Roland, Dr.-Ing. et al
FORRESTER & BOEHMERT
Franz-Joseph-Strasse 38
80801 München (DE)

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(71) Applicant:
Hewlett-Packard Company
Palo Alto, California 94304 (US)

(54) **Encoding and reading information on a roll of media**

(57) A printer system (10) includes a web of media (14) wound about a roll (22). The roll (22) has coded indicia (24) positioned thereon that is arranged to rotate when the roll (22) is rotated. The web of media (14) is engaged by an advancement mechanism which moves the media (14) into a printing position. The movement of the media (14) causes rotation of the roll (22) and causes the coded indicia (24) to move past a detector (28) that is juxtaposed to the roll (22). The detector (28) reads the coded indicia (24) and transmits data derived therefrom to a processor which employs the data to control the print operations of the printer (10).

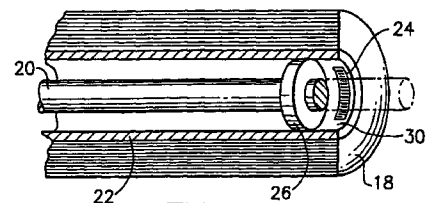


FIG. 3

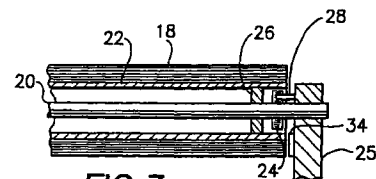


FIG. 3a

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Description

FIELD OF THE INVENTION

This invention relates to printers which employ rolls of media and, more particularly, to a roll of media which has encoded thereon data which is used by the printer for control of operating parameters.

BACKGROUND OF THE INVENTION

Prior art printers have employed either firmware-based commands or software-based commands to set parameters used during the control of the printing process. So long as very few types of inks, media, toners, etc. were used during the operation of such a printer, the aforementioned software/firmware parameter-control techniques were acceptable. Today, however, inkjet printers, for instance, utilize many different types of inks of a variety of colors; laser printers employ multiple different types of toners of different colors, and both types of printers are required to handle a variety of different types of media sheets. Each ink, toner, media type potentially requires a change in one or more printer-control parameters to enable the printer to achieve a high quality print output. It is impractical to require a user to re-program the printer each time, for instance, a different type of media is fed into the printer or a toner is utilized.

Accordingly, the prior art has suggested a variety of means for enabling adjustment of printer parameters, in accordance with changes of printer supplies and media types. U. S. Patent 4,961,088 to Gilliland et al. describes a replaceable toner cartridge for a laser printer which includes a resident memory that stores parameters used in the control of the laser printer. In a similar fashion, Ujita et al. in U. S. Patent 5,506,611 describe a replaceable ink cartridge for an ink jet printer that includes a resident memory, containing parameters used to control the inkjet printer.

U. S. Patent 5,051,779 to Hikawa describes a media sheet which includes markings that are used to control an image processing system. More specifically, special marks on the image sheet are recognized by a scanner in the image processing system and enable a transfer of control commands into the image processing system for control thereof. This concept is carried further by U. S. Patent 5,521,674 to Guillory et al., assigned the same Assignee as this application, wherein marks on a media sheet are sensed and provide control signals to an associated printer. The material used to provide the marks on the sheets is visible, prior to printing on the sheet, but becomes invisible during or after the printing operation.

A variety of printers, plotters, facsimile units, etc., utilize rolls of media, rather than individual sheets of media. If the procedure of printing control indicia on the media is to be used, it is difficult to know, in advance,

where to imprint control indicia because of the uncertainty in predicting the length of media that will be used during a printing/plotting operation. Further, if control indicia are printed along the media, expense is added to the cost of production of the media as a result of a requirement to print the control at repetitive points along the length of the media.

Accordingly, it is an object of this invention to provide a means and method for control of a printer which utilizes a roll of media, wherein control indicia are present on the roll of media.

It is another object of this invention to provide a means and method for the control of a printer via indicia placed on a roll of media, wherein the control indicia are not printed on the media itself.

SUMMARY OF THE INVENTION

A printer system includes a web of media wound about a roll. The roll has code means positioned thereon, with the code means arranged to rotate when the roll is rotated. The media is engaged by an advancement mechanism which moves the media into a printing position. The movement of the media causes rotation of the roll. As a result, the code means are moved past a detector that is juxtaposed to the roll which reads coded indicia printed upon the code means. A processor is coupled to the detector and receives signals from the detector that are indicative of the coded indicia. The processor employs data derived from the signals to control the print operations of the printer.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic view of portions of an inkjet printer, illustrating the positioning of a roll of media vis à vis a printhead.

Fig. 2 is a perspective view of a roll of media before it is mounted on the printer of Fig. 1.

Fig. 3 is a perspective partial sectional view of a roll of media, taken along line A-A in Fig. 1

Fig 3a is a similar sectional view to that of Fig. 3, showing the mounting of a roll of media on a bracket.

Fig. 4 is a perspective view of alternative positions for the mounting of an encoded label on a media roll.

Fig. 5 is a perspective view of an end cap which is mountable on a media roll and includes coded indicia thereon.

DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 illustrates a schematic perspective view of an inkjet printer 10 wherein an inkjet head 12 reciprocates laterally across a media web 14. A drive roller 16 moves media web 14 beneath inkjet head 12 to enable the printing thereon of images, under control of a print controller (not shown). Media web 14 is unrolled from a roll 18 which is mounted for rotation on a spindle 20. Media 14 is wound about a cylindrical core 22 which freely rotates on spindle 20.

It is to be understood that while the ensuing discussion will consider an inkjet printer, that the invention is equally applicable to any printing apparatus which employs a media web.

Fig. 2 shows a dismounted view of media roll 18 and cylindrical core 22. An adhesive label 24 is positioned on the inner circumference of cylindrical core 22 and includes coded information (e.g., a bar code) which when read, informs the host printer of parameters of media roll 18 and other control data to be input to printer 10. Information encoded on label 24 may be a reference to a lookup table stored in printer 10, which reference enables access to parameters which describe the type of media, the dimensions of the media, etc. Such information is then used by printer 10 to set print system parameters, such as print modes, half-toning methods, drying times, etc.

The information on label 24 may, instead of including a reference to a look-up table, contain encoded indicia which provide the actual parameter information directly to the printer.

Fig. 3 is a perspective partial sectional view of media roll 18, taken along line A-A in Fig. 1. Fig 3a is a similar sectional view, showing the mounting of media roll 18 on a bracket 25. Referring to both Figs. 3 and 3a, spindle 20 includes a flange 26 on which media roll 18 is mounted. Flange 26 is inset from the end of media roll 18 to enable an optical detector 28 (shown in Fig. 3a) to extend into hollow inner region 30. Optical detector 28 comprises, for instance, a light emitting diode and a photodetector. The positioning of optical detector 28 is such that when media roll 18 is positioned on spindle 20 and flange 26, label 24 passes directly thereover, enabling optical detector 28 to detect the coded indicia and to provide signals thereof to a connected printer controller (not shown).

When media roll 18 is first positioned on spindle 20 and media 14 is incremented into position beneath inkjet head 12, the rotation of media roll 18 causes a movement of label 24 over optical detector 28. This action enables the coded indicia to be detected and the resulting signals fed to the printer controller. Thereafter, printer 10 is set up in such a manner as to adjust to the specific characteristics of media 14.

Referring to Fig. 4, an enlarged view of an end of media roll 18 is shown, illustrating the preferred positioning of label 24. An alternative location for the posi-

tioning of the encoded indicia may be on a terminating end 33 of cylindrical core 22. If the alternative location is used, an optical detector 34 (see Fig. 3a) is positioned opposite the end 33 of core 22 so as to be able to read the encoded indicia.

Fig. 5 illustrates a further alternative technique for applying encoded labeling to roll 18. In this case, the encoding is imprinted on a surface of an end cap 36 which fits over an end of media roll 18 and is mounted for rotation therewith. An optical detector 34, such as shown in Fig. 4, is used to read the encoded indicia on the surface of end cap 36.

As can be seen from the above, the invention enables the positioning of coded indicia on each media roll during the production phase. Whenever the media roll is changed, the printer reads the encoded information and sets up its operating parameters, accordingly. The invention eliminates any need to print the code on the media itself. Further, there is no requirement for the user to enter data regarding the identity of the media, as the media roll carries that information itself. While the encoded indicia have been described as being positioned on a label, such indicia may be directly printed on core 22 or on end cap 36.

It should be understood that the foregoing description is only illustrative of the invention. Various alternatives and modifications can be devised by those skilled in the art without departing from the invention. For instance, while an optical detector has been described above, other code reading techniques are contemplated as within the scope of the invention, e.g., magnetic sensing of magnetic characters, etc. Further, the coded indicia may be directly printed on the media roll instead of being applied by a label. Also, the coded indicia may be read while the roll is stationary, if a scanned detector is utilized. Accordingly, the present invention is intended to embrace all such alternatives, modifications and variations which fall within the scope of the appended claims.

Claims

1. A printer system (10) comprising:

a roll (22);

a web of media (14) wound about said roll (22);

coded indicia (24) on said roll (22) and rotatable therewith during operation of said printer system (10);

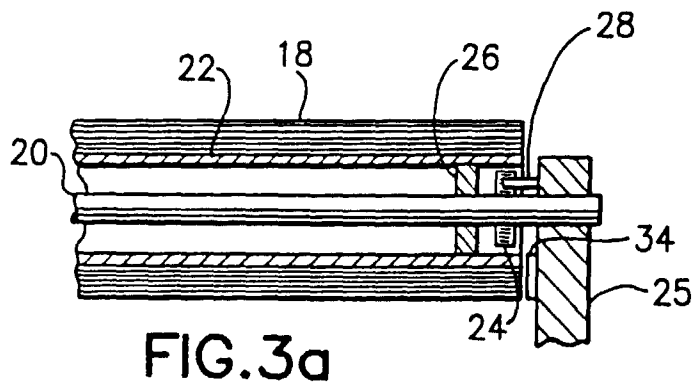
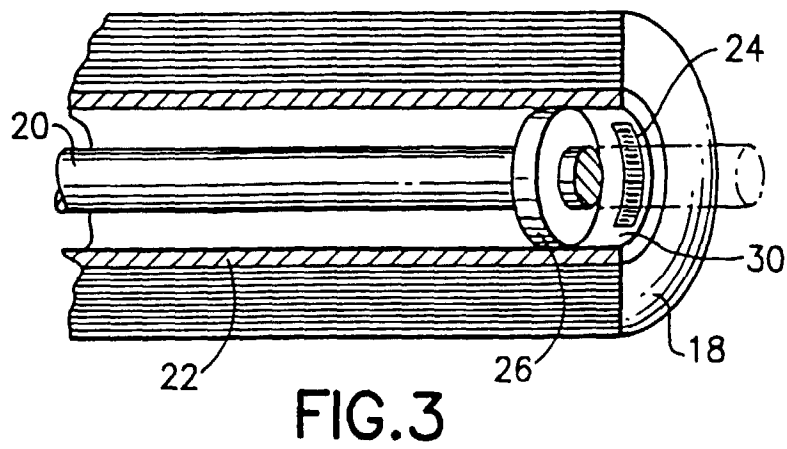
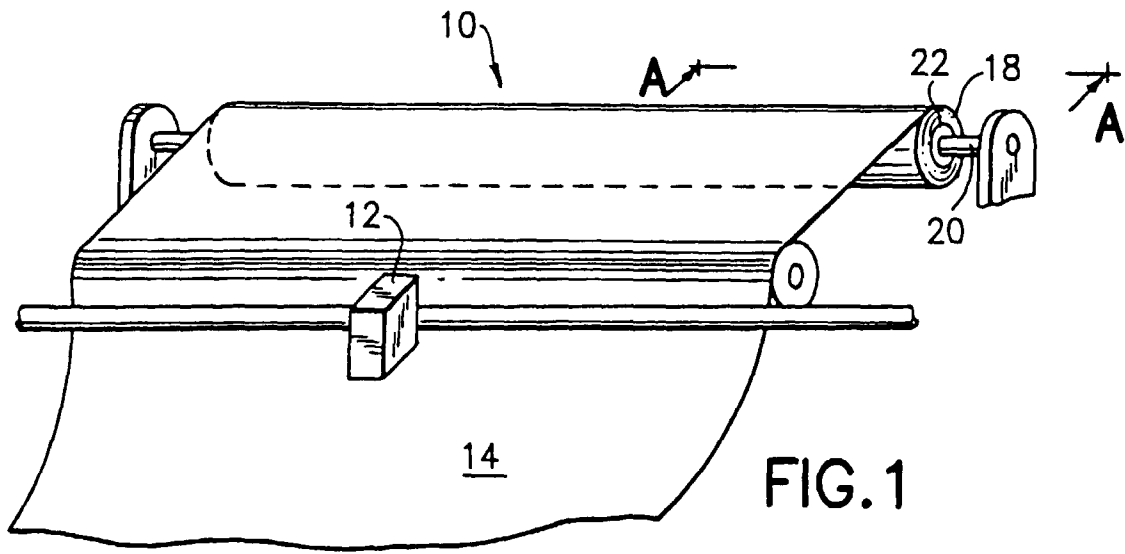
means for moving said web of media (14) into a printing position, said moving causing rotation of said roll (22); and

detector means (28) for reading said coded indicia (24) from said roll (22) and for providing

signals in accordance therewith to said printer system (10).

2. The printer system (10) as recited in claim 1, wherein said coded indicia (24) are read by said detector means (28) while said roll (22) is rotating. 5
3. The printer system (10) as recited in claim 1, wherein said coded indicia (24) are positioned on a label that is affixed to said roll (22). 10
4. The printer system (10) as recited in claim 1, wherein said coded indicia (24) are positioned on an inner surface of said roll (22). 15
5. The printer system (10) as recited in claim 1, wherein said coded indicia (24) are positioned on an end of said roll (22).
6. A media roll (18) for a printing system (10), said printing system (10) having a media detector (28), said media roll (18) comprising: 20
 - a roll (22); 25
 - a web of media (14) wound about said roll (22); and
 - coded indicia (24) on said roll (22) and rotatable therewith during operation of said printing system (10), said coded indicia (24) disposed to move past said media detector (28) so as to enable said coded indicia (24) to be sensed thereby. 30
7. The media roll (18) as recited in claim 6, wherein said coded indicia (24) are read by said media detector (28) when said roll (22) is rotating. 35
8. The media roll (18) as recited in claim 6, wherein said coded indicia (24) are positioned on a label that is affixed to said roll (22). 40
9. The media roll (18) as recited in claim 6, wherein said coded indicia (24) are positioned on an inner surface of said roll (22). 45
10. The media roll (18) as recited in claim 6, wherein said coded indicia (24) are positioned on an end of said roll (22). 50

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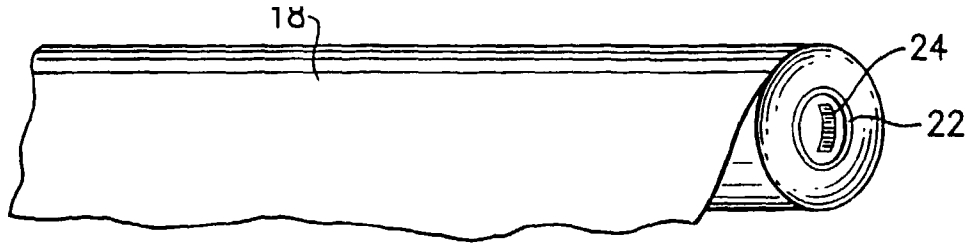


FIG. 2

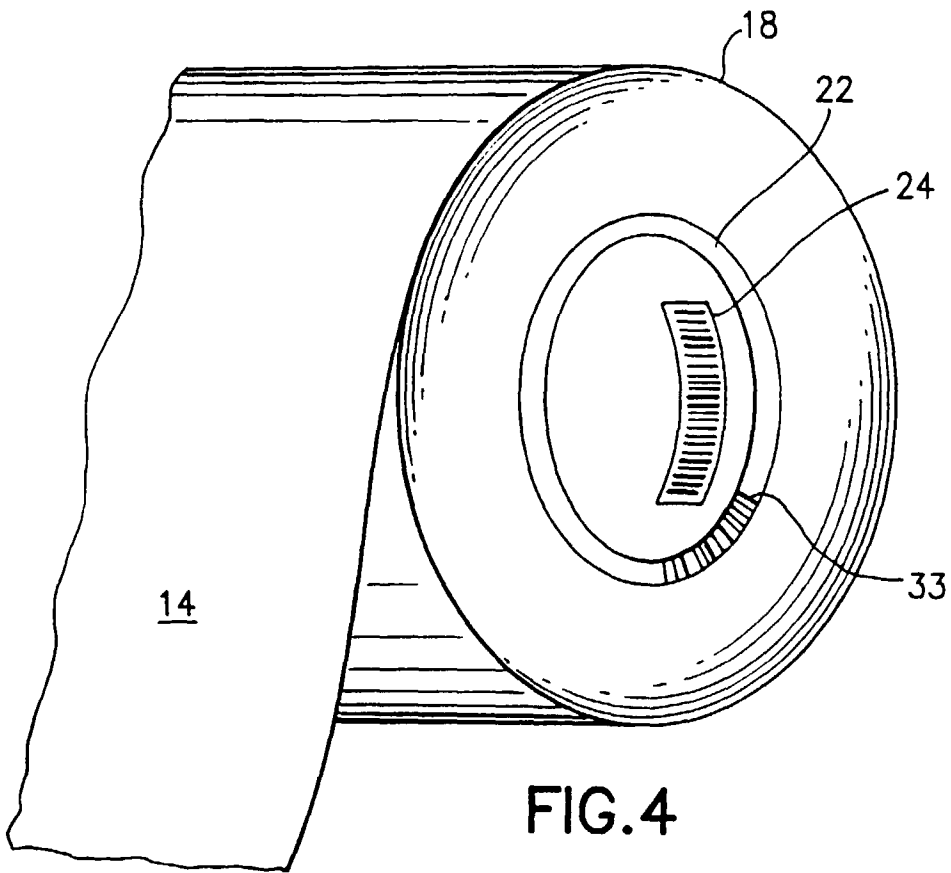


FIG. 4

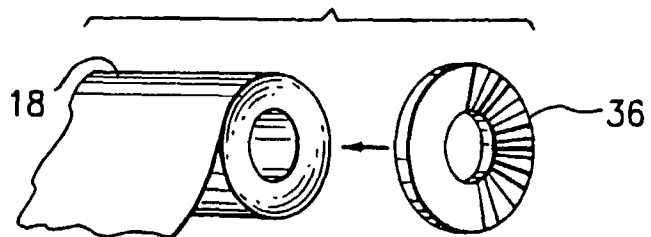


FIG. 5



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EUROPEAN SEARCH REPORT

Application Number
EP 97 11 9190

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.6)
X	FR 2 670 927 A (OCE GRAPHICS FRANCE) 26 June 1992 * abstract * * page 1, line 29 - line 32 * * page 4, line 18 - line 22 * * page 5, line 26 - line 31 * * page 8, line 4 - line 18; claims 1-6,11,14,15; figures *	1-3,6-8	B65H75/18
X	PATENT ABSTRACTS OF JAPAN vol. 009, no. 042 (M-359), 22 February 1985 -& JP 59 182146 A (FUJI XEROX KK), 16 October 1984 * abstract *	1,5,6,10	
X	PATENT ABSTRACTS OF JAPAN vol. 014, no. 083 (M-0936), 16 February 1990 -& JP 01 297266 A (NEC CORP), 30 November 1989 * abstract *	1,4,6,9	
X	PATENT ABSTRACTS OF JAPAN vol. 015, no. 021 (M-1070), 17 January 1991 -& JP 02 265855 A (MITSUBISHI PAPER MILLS LTD), 30 October 1990 * abstract *	1-4	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B65H B41J G03G
X	US 4 463 251 A (KOUTONEN PAULI ET AL) 31 July 1984 * column 1, line 18 - line 25 * * column 6, line 8 - line 22 * * column 8, line 14 - line 41; figure 4 *	1,3,4,6,8,9	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 4 August 1998	Examiner Haaken, W
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	

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EUROPEAN SEARCH REPORT

Application Number
EP 97 11 9190

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.6)
X	US 5 268 581 A (SHOWALTER JOHN) 7 December 1993 * column 1, line 1 - line 16 * * column 3, line 67 - column 4, line 4 * * column 5, line 1 - line 18 * * column 6, line 13 - line 46 * * figures * ---	1-3	
E	DE 196 53 814 A (KOENIG & BAUER ALBERT AG) 25 June 1998 * column 2, line 10 - line 20 * * figures * * column 3, line 12 - line 29 * -----	6,7,9,10	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
Place of search THE HAGUE		Date of completion of the search 4 August 1998	Examiner Haaken, W
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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