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(54) Output apparatus

(57) An output apparatus includes a font information memory 22 for outputting a pattern on the basis of information from a host computer 1, a selector 26 for designating an attribute of fonts, and a dot printer 25 for outputting a table of the fonts having the attribute designated by the selector.

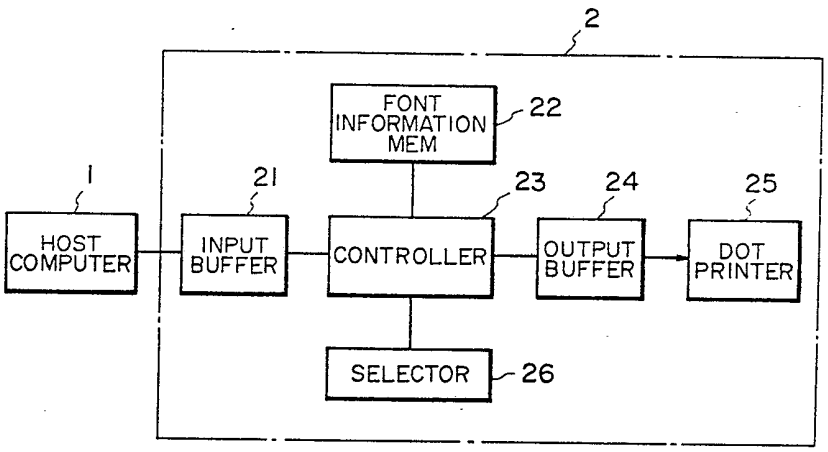

FIG. 1

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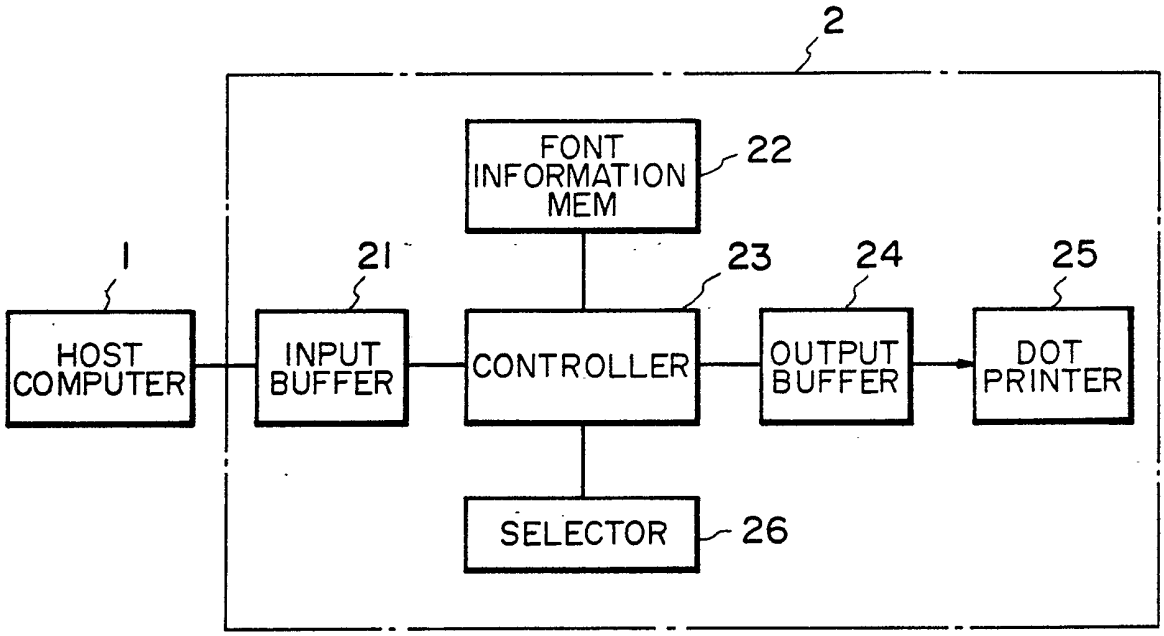
2
FONT INFORMATION MEM
22
1
21
23
24
25
HOST COMPUTER
INPUT BUFFER
CONTROLLER
OUTPUT BUFFER
DOT PRINTER
SELECTOR
26

FIG. 1

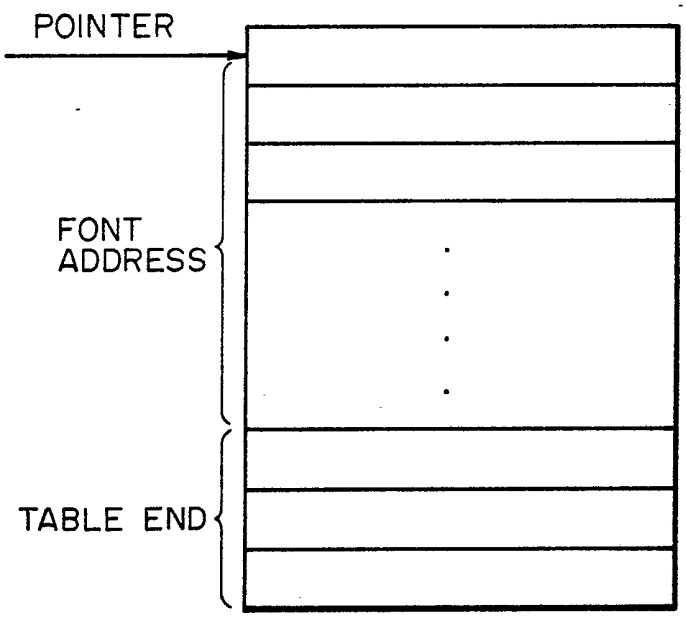
POINTER
FONT ADDRESS
TABLE END

FIG. 2

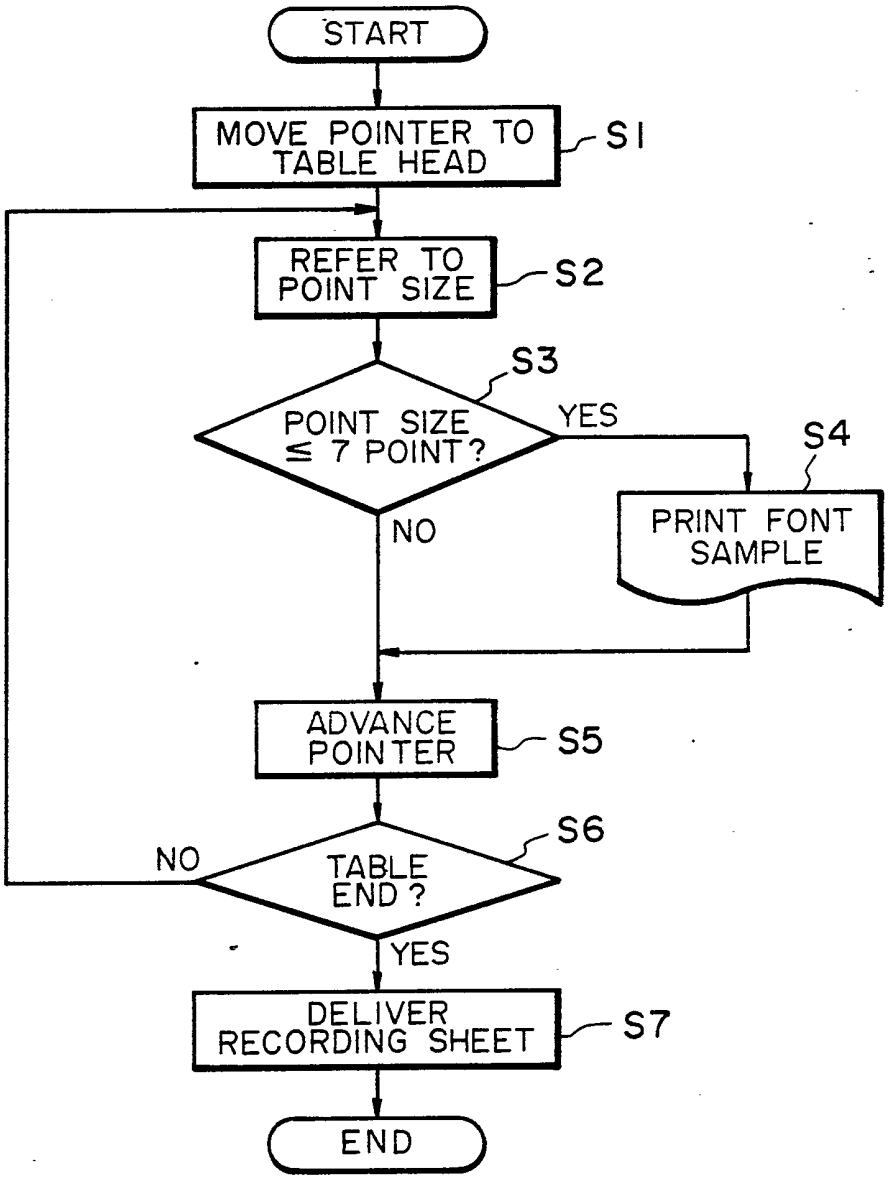
START
MOVE POINTER TO TABLE HEAD
S1
REFER TO POINT SIZE
S2
S3
POINT SIZE ≤ 7 POINT?
YES
S4
NO
PRINT FONT SAMPLE
ADVANCE POINTER
S5
S6
NO
TABLE END?
YES
DELIVER RECORDING SHEET
S7
END

FIG. 3

FIG. 4

PITCH	POINT SIZE	STYLE	STROKE WEIGHT	TYPE FACE	SAMPLE
10.00	3.60	Upright	Medium	80:Mincho	ABCDEfghij123!#$'*:^V●⌐
10.00	3.60	Upright	Medium	80:Mincho	チツテトナジズゼゾダアイウ。ー゛ァェサシセタロ
7.50	4.80	Upright	Medium	80:Mincho	ABCDEfghij123!#$
7.50	4.80	Upright	Medium	80:Mincho	チツテトナジズゼゾダアイウ。ー゛
10.00	3.60	Upright	Medium	81:Gothic	ABCDEfghij123!#$'*:^V●
10.00	3.60	Upright	Medium	81:Gothic	チツテトナジズゼゾダアイウ。ー゛ァェサシセタ
7.50	4.80	Upright	Medium	81:Gothic	ABCDEfghij123!#$
7.50	4.80	Upright	Medium	81:Gothic	チツテトナジズゼゾダアイウ。ー゛

FIG. 5

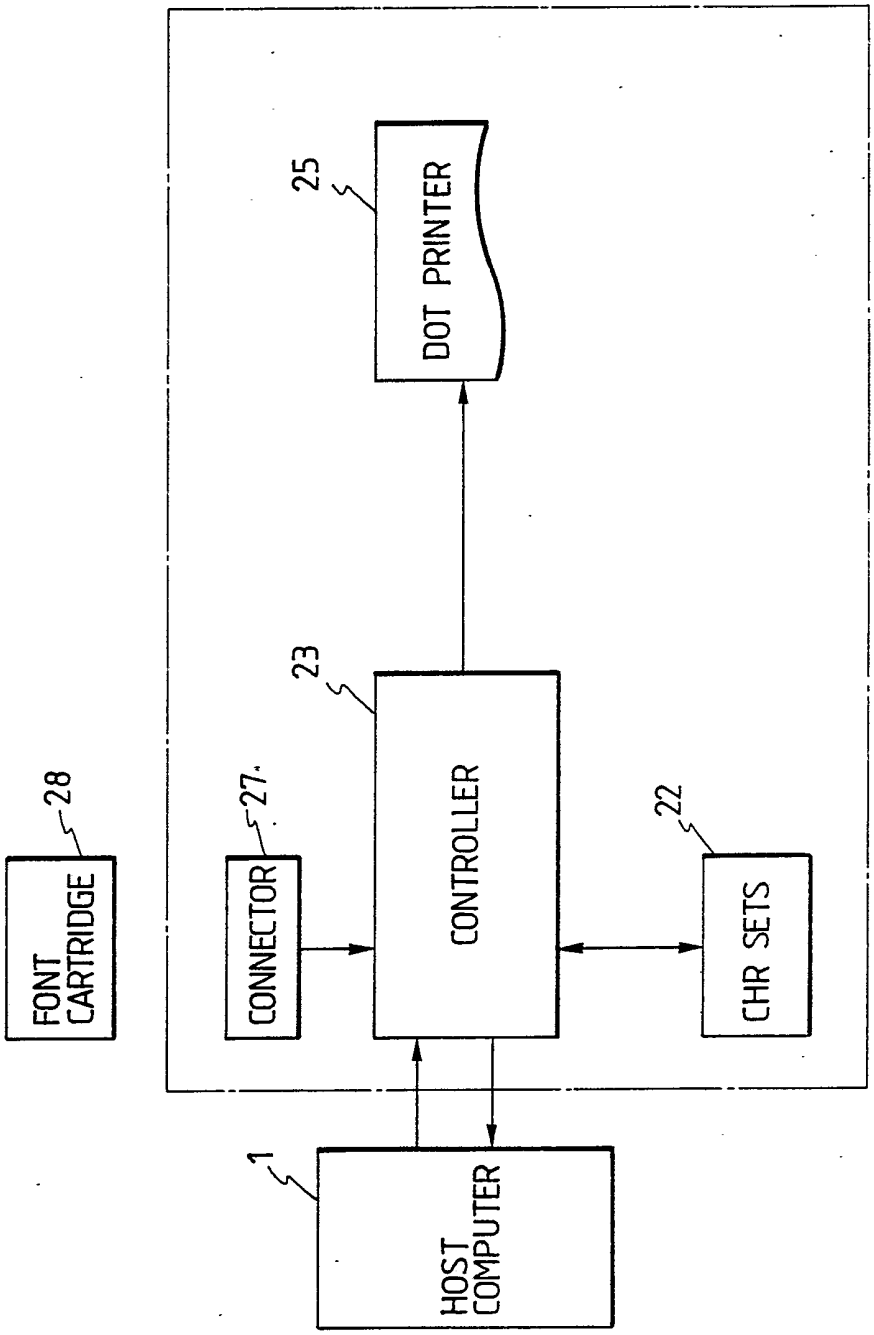
25
DOT PRINTER
23
CONTROLLER
28
FONT CARTRIDGE
27
CONNECTOR
22
CHR SETS
1
HOST COMPUTER

FIG. 6

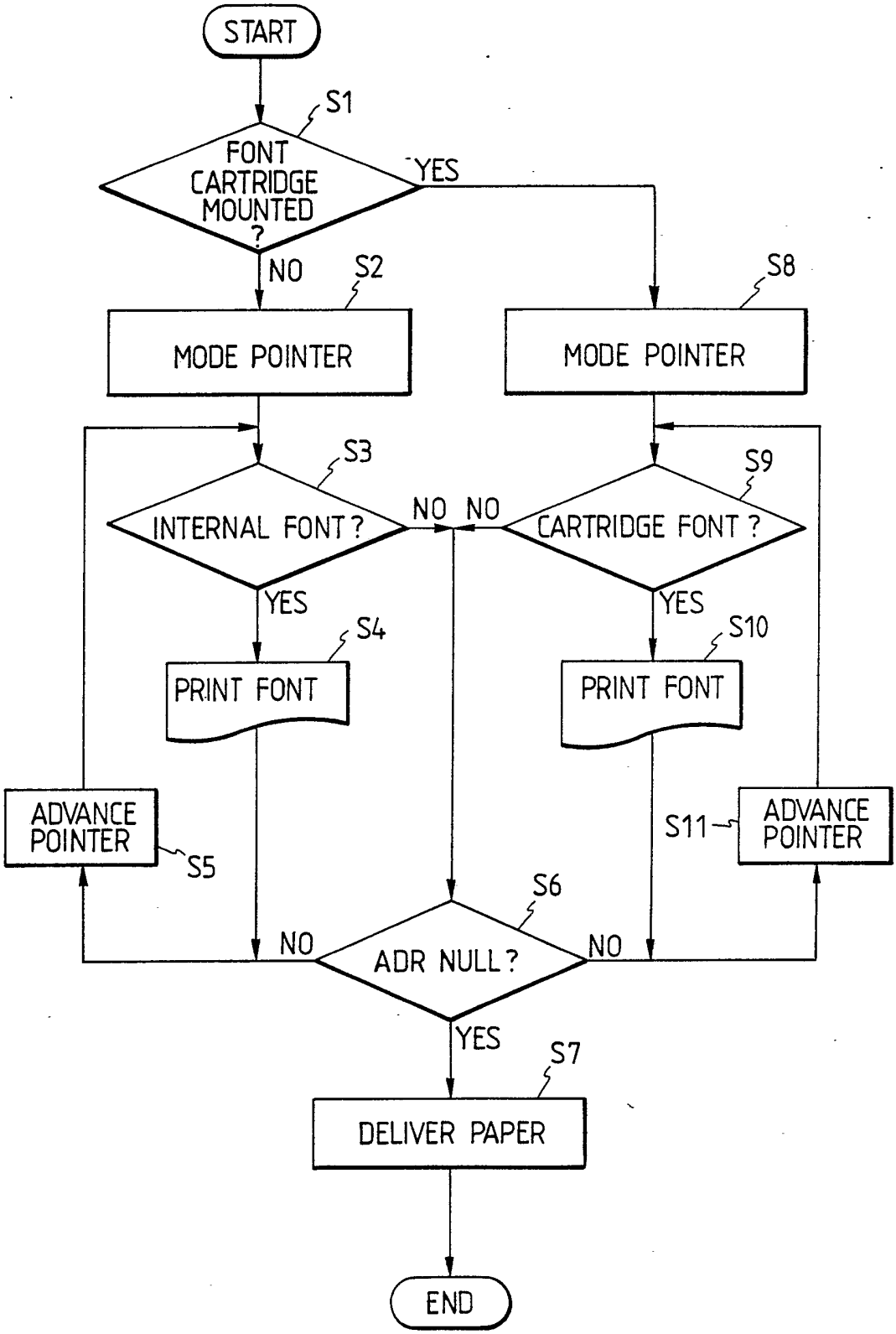
START
S1
FONT CARTRIDGE MOUNTED ?
YES
NO
S2
MODE POINTER
S8
MODE POINTER
S3
INTERNAL FONT ?
NO
NO
S9
CARTRIDGE FONT ?
YES
YES
S4
PRINT FONT
S10
PRINT FONT
ADVANCE POINTER
S5
S11
ADVANCE POINTER
S6
NO
ADR NULL ?
NO
YES
S7
DELIVER PAPER
END

FIG. 7

GRAPHIC SET	PITCH	POINT SIZE	STYLE	STROKE WEIGHT	TYPE FACE	SAMPLE
FONT CARTRIDGE						
R 001 ALP10. ROMA [J]	10.00	12.00	Upright	Medium	0:Line Print	ABCDEfghi
R 004 ALP10. KATA [I]	10.00	12.00	Upright	Medium	0:Line Print	チツテトナ
R 005 A2040M ROMA [J]	12.00	12.00	Upright	Medium	80:Mincho	ABCDEfg
R 008 A2040M KATA [I]	12.00	12.00	Upright	Medium	80:Mincho	チツテトナジズゼ
R 009 A2040M HIRA [1]	12.00	12.00	Upright	Medium	80:Mincho	ちつてとなじずぜぞだ
R 010 A2040M N_hKEI [)#4]	12.00	12.00	Upright	Medium	192:Keisen 1	┼┼┼┼┼┼┼┼

TITLE OF THE INVENTION:

Output Apparatus

BACKGROUND OF THE INVENTION:

Field of the Invention

The present invention relates to an output apparatus such as various types of printer and, more particularly, to an output apparatus capable of outputting a table of font information of a desired attribute.

Related Background Art

A conventional apparatus capable of outputting a table of font information outputs a table of all font information stored in the system.

In the conventional apparatus described above, however, the following problem is posed since the list of all font information stored in the system is output.

When the number of fonts existing in a printer is large, the number of sheets to be output is increased. When only some pieces of font information are required, a large number of sheets are wasted. This also occurs in an apparatus to which a font cartridge is attached.

SUMMARY OF THE INVENTION:

The present invention has been made in consideration of the above situation, and has as its object to provide an output apparatus including a means for designating attributes such as a type and number of output font information, wherein a table of only the

designated font information can be output.

It is another object of the present invention to provide an output apparatus for outputting font information in accordance with a cartridge attached thereto or a designated attribute.

BRIEF DESCRIPTION OF THE DRAWINGS:

Fig. 1 is a block diagram showing an arrangement of a printing apparatus according to an embodiment of the present invention;

Fig. 2 is a format showing a table in which font addresses are stored;

Fig. 3 is a flow chart for explaining operations until information of fonts of 7 point or less is output;

Fig. 4 is a view showing an information output when point size is 7 point or less;

Fig. 5 is a block diagram of a printing apparatus according to a second embodiment of the present invention;

Fig. 6 is a flow chart for outputting font information stored in a font cartridge attached to the printer; and

Fig. 7 is a view showing an output example of font information stored in the font cartridge.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT:

A preferred embodiment of the present invention will be described with reference to the accompanying drawings.

Fig. 1 is a block diagram showing an arrangement of a printing apparatus according to the embodiment of the present invention.

Referring to Fig. 1, a host computer 1 is connected to the input of an input buffer 21, and the output of the input buffer 21 is connected a controller 23. The controller 23 is also connected to a font information memory 22, a selector 26, and an output buffer 24. The output of the output buffer 24 is connected to a dot printer 25. The input buffer 21, the font information memory 22, the controller 23, the selector 26, the output buffer 24, and the dot printer 25 constitute a printing apparatus main body 2. The main body 2 comprises a microprocessor including a RAM and a ROM.

The host computer 1 externally outputs printing data and a printing command. A printer data code output from the host computer 1 is input to the input buffer 21. The font information memory 22 stores dot patterns of plural types of characters and attribute information of the character set. The controller 23 controls the operations of the overall printing apparatus. The output buffer 24 sends converted pattern data to the dot printer 25. The dot printer 25 forms a permanent visible image on a sheet on the basis of the converted pattern data. The selector (e.g., keys) 26 selectively outputs a table of desired character attributes (to be described later). The selector 26 can select one or

more attributes. When slots for receiving font cartridges are formed in the printer, one of the slots may be designated.

Fig. 2 is a table for storing font addresses.

No font addresses are stored in the table end of the font address table shown in Fig. 2.

Fig. 3 is a flow chart for explaining operations until information of fonts having point sizes of 7 point or less is output.

Character attributes of the font include a character pitch, a character style, and a character point size.

The flow chart in Fig. 3 will be described below.

In step S1, a printer is moved to the font address table (Fig. 2) head.

In step S2, the controller 23 refers to a point size column of the font information memory 22.

If the point size of the character is less than 7 point, the flow advances to step S4, and the corresponding font samples (i.e., information of font) are printed at the dot printer 25. In step S5, the pointer is advanced, and the flow advances to step S6.

However, if the point size is larger than 7 point, the pointer is advanced in step S5, and the flow advances to step S6.

If the pointer designates the font address table end, all font samples (information of fonts) having

point sizes of 7 point or less have been printed. Therefore, a sheet having printed contents of the font information of 7 point or less is discharged.

However, if the pointer does not designate the font address table end, the flow returns to step S2.

As is apparent from the description, it is possible to print only information of fonts having point sizes of 7 point or less and discharge the printed sheet.

Fig. 4 shows an information output of fonts having point sizes of 7 point or less. In this case, pitch sizes, point sizes, styles, stroke weights (thickness or density of a printed character), type faces (e.g., Ming and Gothic), and character samples are output.

In the above embodiment, of all pieces of character attribute information, information of fonts having point sizes of 7 point or less is output. However, by using the same method as described above, information of other character attributes (e.g., the character pitch and the character style) can be selected and output.

It is also possible to select the number and type of font information and output them.

As has been described above, the attributes such as the type and number of font information are designated, and a table of only the designated information can be output, thereby obtaining a table of only desired fonts.

Fig. 5 is a block diagram showing an arrangement to which an external font cartridge is connected. The same

reference numerals as in Fig. 1 denote the same parts. An input/output buffer is not shown for illustrative convenience. Referring to Fig. 5, a font cartridge 28 is connected to a controller 23 through a connector 27. A plurality of connectors (right and left connectors) may be used, and a priority may be assigned to these connectors.

Fig. 6 is a flow chart showing operations until font information is printed and output. Referring to Fig. 6, the controller 23 determines in step S1 whether the font cartridge 28 is mounted to the connector 27. A mounting state is detected by checking whether, e.g, a pair of arbitrary connecting pins of the connector 27 connected to the controller 23 are short-circuited upon mounting of the font cartridge 28. If NO in step S1, the flow advances to step S2, and the pointer is moved to the head or start address of the internal font address table shown in Fig. 2. The flow advances to step S3. If the content represented by the pointer is an internal font, the flow advances to step S4. The internal font information is printed at a dot printer 25.

However, if it is determined in step S3 that the content represented by the pointer is not an internal font, the flow advances to step S6. If the content of the pointer is not "NULL", the flow advances to step S5. However, if YES in step S5, the flow advances to step S7

since all information associated with the internal font in the table has been printed out. The print contents of the internal font information are printed at the printer, and the printed sheet is exhausted. Note that the "NULL" state represents a state in which no font address is available.

If the controller 23 determines in step S1 that the font cartridge 28 is mounted, the flow advances to step S8, and the pointer is moved to the head of the font address table of the font cartridge 28. The flow advances to step S9. If the content of the pointer represents a font of the font cartridge, the flow advances to step S10, and information of the font of the font cartridge is printed at the dot printer 25. The pointer is incremented by one in step S11, and the flow returns to step S9.

If the content of the pointer does not represent a font of the font cartridge 28, the flow advances to step S6. If the content of the pointer does not represent the "NULL" state, the flow advances to step S7. The contents of the font information of the font cartridge 28 are printed, and the printed sheet is exhausted.

As described above, when the font cartridge 28 is mounted in the printing apparatus, only font information of the font cartridge 28 is printed. After the contents of the font information are printed, the printed sheet can be exhausted.

Fig. 7 shows an output example of font information when the font cartridge is mounted to the output apparatus.

In the above embodiment, a character set storage means detachably mounted to the printing apparatus through the connector is exemplified as a font cartridge. However, the printing apparatus of the present invention is also applicable to a character set storage means such as an IC ROM card, an optical disk ROM having the same function as the font cartridge, and the like.

As described above, the character font information stored in the printing apparatus and the character font information stored in the external character set storage means can be selectively used to prevent printing of unnecessary font information.

The printing apparatus according to the present invention has the above arrangement. Therefore, waste of recording media, i.e., sheets at the time of output of font information can be prevented, and only desired font information can be printed within a short period of time.

Control in Fig. 3 may be combined with control in Fig. 6 to output font information of a given attribute from a font cartridge connected to the printing apparatus in accordance with the size conditions, the attribute conditions, and font cartridge connecting

conditions. Font information of a given attribute from the internal cartridge and the cartridge connected to the printing apparatus may be output.

WHAT IS CLAIMED IS:

1. An output apparatus comprising:

output means for outputting a pattern on the basis of information from a host computer;

means for designating an attribute of fonts; and

means for outputting a table of the fonts having the attribute designated by said designating means.

2. An apparatus according to claim 1, wherein the attribute includes a character pitch, a character style, and a point size of a character.

3. An output apparatus comprising:

memory means for storing pattern information which represents plural types of characters and attribute information;

means for designating a plurality of attributes;

readout means for selectively reading out from said memory means pattern information corresponding to the attributes designated by said designating means; and

means for outputting the pattern information read out by said readout means.

4. An apparatus according to claim 3, wherein the attributes include a character pitch, a character style, and a point size of a character.

5. An output apparatus substantially as described with reference to the drawings.

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