

PATENT SPECIFICATION

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(54) PRINTER

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 tively, do hereby declare the invention for
 which we pray that a patent may be granted
 to us and the method by which it is to be
 performed to be particularly described in
 and by the following statement:—

This invention relates to printers, and in
 particular, although not so restricted, to on-
 the-fly printers.

According to the present invention there
 is provided a printer including a carrier on
 which print characters are mounted, a
 plurality of hammers arranged to strike a
 selected one or more print characters during
 a printing operation, a first resilient mask
 disposed between the carrier and an inked
 ribbon to prevent the latter from coming
 into contact with the print characters except
 during a printing operation, a second re-
 silient mask disposed between the first mask
 and the hammers, the further resilient mask
 being arranged to prevent the inked ribbon
 from coming into contact with print paper
 disposed between the first mask and the
 hammers except during a printing
 operation.

The carrier may be a print drum.

The invention is illustrated, merely by
 way of example, in the accompanying
 drawings, in which:—

Figure 1 shows schematically, in section, a
 conventional printer;

Figure 2 is a perspective view of a printer
 according to the present invention; and

Figure 3 is a schematic sectional view of
 the printer of Figure 2.

A conventional on-the-fly printer, illus-
 trated in Figure 1 includes a rotatable print
 drum 10 carrying print characters 11, a
 plurality of print hammers 12, only one of
 which is shown, and a relatively narrow
 inked ribbon 13. During a printing operation
 one of the hammers is actuated to move the
 inked ribbon and print paper 14 disposed

between the hammers and the print drum, 50
 towards a selected print character. The
 hammer strikes the selected print character
 and ink is transferred from the inked ribbon
 to the print paper.

The inked ribbon may be a two-colour 55
 inked ribbon so that printing in two colours
 may be performed.

The disadvantage of placing the print
 paper between the print drum 10 and the
 inked ribbon 13 is that the printing may be 60
 unclear or of untidy and dirty appearance if
 thick print paper is used. In fact, the clarity
 of printing becomes worse as the thickness
 of the print paper increases.

This disadvantage could be reduced by 65
 placing the inked ribbon between the print
 drum and the print paper. However, this in
 turn, has the disadvantage that the inked
 ribbon may be snared by the print drum
 whilst it rotates and this snaring tends to 70
 interfere with the continuous operation of
 the printer.

A printer, for example, an on-the-fly
 printer, according to the present invention is
 illustrated in Figures 2 and 3. This printer 75
 makes clear printing possible even when
 using relatively thick print paper.

The printer shown in Figures 2 and 3
 includes a print drum, 21 carrying print
 carriers 21' of the peripheral surface there- 80
 of. The print drum 21 is supported for
 rotation upon a shaft 22 which also carries
 detecting means 23 arranged to detect the
 position of a print character selected for a
 given printing operation. A plurality of 85
 hammers 25 are disposed to strike a selected
 one or more print characters during the
 printing operation. A narrow inked ribbon
 26, which may be a two-colour ribbon is dis- 90
 posed between a first mask 27, provided for
 the purpose of preventing the inked ribbon
 coming into contact with the print drum and
 being snared thereby except during a
 printing operation, and a second mask 28 for 95
 preventing the inked ribbon from touching
 print paper 29 again except during a printing
 operation. A roller 30 (Figure 3) and a roller
 30' are urged into contact with the print

paper therebetween, the purpose of these rollers being to feed the print paper to a guide 31 from whence it passes between the hammers 25 and the second mask 28. It will be appreciated that by this arrangement clear printing will be obtained no matter the thickness of the print paper.

The printer described above is also designed to prevent dirtying of the print paper caused by contact with the inked ribbon, and to improve the efficiency of printing. The first mask 27 and the second mask 28 are resilient so that the force supplied by a hammer to effect a printing operation is relatively small. When no printing operation is being performed, the first mask 27 keeps the inked ribbon 26 out of contact with the print drum so that the inked ribbon cannot interfere with the rotation thereof. At the same time the second mask 28 keeps the print paper away from the inked ribbon so as to prevent the print paper from becoming dirty. When a printing operation is performed, the first mask 27 is moved to the position shown in dotted lines in Figure 3 on movement of the hammer to strike the selected print character. After the printing operation has been performed the first mask 27 returns to the position shown in solid lines in Figures 3 and the inked ribbon 26 and the print paper 29 are separated quickly from the print drum and from one another by virtue of the resiliency of the first mask and the second mask. Thus unnecessary dirtying of the print paper and snaring of the inked ribbon with the print drum can be prevented. Furthermore, since the inked ribbon 26 and the print paper 29 are kept out of contact by the first mask 27 and the second mask 28 when a printing operation is not being performed, and by virtue of the paperguide 31, the inked ribbon and the print paper can both be advanced or fed quickly. Since the first mask 27 and the second mask 28 may be constructed as a unit, the desired quality of printing can easily be obtained and maintained.

Thus, the printer described above with reference to Figures 2 and 3 can perform extremely clear printing without there being a reduction in printing speed and without there being a limit to the thickness and number of sheets of printing paper and in spite of the use of a narrow inked ribbon.

Although the print characters have been illustrated as being carried on the print drum 21, the print characters may be provided on a print belt, a print bar, a print chain, etc.

The printer is particularly useful in connection with a register, e.g. a cash register, where thick print paper, e.g. chits and account papers, or a large number of sheets are used and where clear printing is required.

WHAT WE CLAIM IS:—

1. A printer including a carrier on which print characters are mounted, a plurality of hammers arranged to strike a selected one or more print characters during a printing operation, a first resilient mask disposed between the carrier and an inked ribbon to prevent the latter from coming into contact with the print characters except during a printing operation, a second resilient mask disposed between the first mask and the hammers, the further resilient mask being arranged to prevent the inked ribbon from coming into contact with print paper disposed between the first mask and the hammers except during a printing operation.

2. A printer as claimed in claim 1 in which the carrier is a print drum.

3. A printer substantially as herein described with reference to, and as shown in Figures 2 and 3 of the accompanying drawings.

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