

"PRINTER"

This invention relates to a printer such, for example, as a serial printer.

5 A printer such as a wire dot printer is known which has an opening in an upper surface of an housing which accommodates a printing means, the opening being provided to permit the exchange of a ribbon cassette or to facilitate the positioning of record paper. The opening is opened and closed by a rotatable cover. When a single sheet of paper is used as a record sheet in such a printer, a paper
10 feeder for the single sheet of paper is set on an upper surface of the housing and has a paper receiver which receives the single sheet of printed paper.

This known printer, however, has a complicated construction in which the sheet feeder and the sheet
15 receiver are mounted on the upper housing surface and it therefore requires the provision of considerable space. In particular, if a cut-paper feeder and a printed-paper receiver are provided, these parts protrude high from the upper housing surface, so that they are not easy to use
20 and a large opening is necessarily formed in the upper housing surface through which printing noise can be outwardly transmitted.

According to the present invention, there is therefore provided a printer having a housing within which is disposed a printing mechanism, the housing having at least one rotatable cover for opening and closing an aperture in the housing; the or each cover having an opening therein, through which may pass a sheet of paper, and a rotatable closure member for opening and closing the said opening in the respective cover; the or each cover having mounting means which, when the respective closure member is open, is adapted to provide a mounting for a removable paper receiving means.

Preferably, there are two rotatable covers.

Preferably, when the paper receiving means is mounted in one of the said openings, the arrangement is such that, in operation, a sheet of printed paper is passed thereto with its printed surface facing outwardly, while when the paper receiving means is mounted in the other opening, the arrangement is such that, in operation, a sheet of printed paper is passed thereto with its printed surface facing inwardly.

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

Figures 1 and 2 are broken away cross-sectional views of a printer according to the present invention, Figures 1 and 2 respectively showing parts of the printer in

different relative positions.

In the drawings there is shown a printer according to the present invention, the printer having a housing 1 within which is disposed a printing mechanism A which may, as shown, comprise a carriage 4 which is slidably mounted on guide shafts 2,3; a printing head 5 which is mounted on the carriage 4; and a platen 6 which faces the front end portion of the printing head 5. A pinch roller 7 is biased resiliently against the outer periphery of the platen 6, and a paper feed roller 8 and a pinch roller 9 are disposed immediately above the platen 6. The platen 6 and the paper feed roller 8 are driven by gearing comprising a paper feed roller (not shown). Paper guides 10, 11 and 12 are disposed around the platen 6.

A sheet of unprinted paper P1 (Figure 2) is fed, e.g. by a paper feeder (not shown), in the direction of an arrow 13 between the platen 6 and the pinch roller 7, and then between the platen 6 and the printing head 5, and thereafter between the paper feed roller 8 and the pinch roller 9 in the direction of an arrow 14. As a result, a sheet of paper P2, which has been printed by the printing head 5, is stocked in a removable paper receiving means or receiver 15.

The lower end of a printed sheet P2 which is mounted in the paper receiver 15, is disposed in a paper tray or

receiver 16 which is mounted beneath the paper receiver 15 and adjacent to the platen 6.

A large aperture 17 is provided in the upper portion of the housing 1 to permit an ink ribbon cassette (not shown) to be passed therethrough during replacement of cassettes. The aperture 17 may be opened and closed by a first rotatable cover 18 and by a second rotatable cover 19.

The cover 18 is rotatable about a shaft or pivot 18a which is carried by the housing 1, the cover 18 having a small opening 18b which is provided in an intermediate portion of the cover 18 to permit the discharge therethrough of a sheet of printed paper P2. A small rotatable closure member 20 is provided to effect opening and closing of the opening 18b, the closure member 20 being rotatable around a shaft or pivot 20a. The cover 18 has right and left side walls 18c (only one shown) which partition the opening 18b. Each of the side walls 18c has a protruding mounting means or projection 18e which is adapted to provide a mounting for the respective side edge of the paper receiver 15 in cooperation with a side wall 18d. The depth to which the paper receiver 15 can be inserted is restricted by paper guides 15a which are formed on the opposite side edges of the paper receiver 15.

Therefore, when in operation the paper receiver 15 is mounted on the cover 18 as shown in Figure 2, in which the closure member 20 is open, a single sheet of printed paper P2, as shown by chain dotted lines, can be disposed therein with its printed surface facing outwardly (namely, in the direction away from the base of the paper receiver 15).

The construction of the cover 19 is substantially identical to that of the cover 18. The cover 19 is rotatable around a shaft or pivot 19a and has a small opening 19b (see Figure 1) provided at one end to permit a single sheet of printed paper P2 to pass through the opening 19b. A small rotatable closure member 21 is mounted for rotation about a shaft or pivot 21a so that it can open or close the opening 19b. The cover 19 has right and left side walls 19c (only one shown) which partition the small opening 19b. Each of the side walls 19c has a protruding mounting means or projection 19e which is adapted to provide a mounting for the respective side edges of the paper receiver 15 so that the latter may be removably mounted therein in cooperation with a side wall 19d. The depth to which the paper receiver 15 can be inserted is restricted by a projection 19f (Figure 2) which is formed integrally with the lower end of the side wall 19d.

The paper receiver 15 can be mounted between the side wall 19d and the mounting means 19e when the closure member 21 is open. It is to be noted that, when the paper receiver 15 is mounted like this, an auxiliary paper feed unit B (Figure 1), which constitutes an auxiliary device or an optional device, must be used.

The auxiliary paper feed unit B has a pair of right and left side plates 22 (only one of which is shown in Figure 1) each of which has at its lower end a groove 22a which removably receives a shaft 24 which extends from a side plate or side plates 23 of the printing mechanism A. The pair of side plates 22 support a paper feed roller 25, a pinch roller 26 and gear wheel 27-29 which drive the paper feed roller 25. When the unit B is mounted as shown in Figure 1, a gear wheel 29 is arranged to mesh with a gear wheel 30 which is drivingly connected to the feed roller 8. Therefore, when the platen 6 and the feed roller 8 are driven by a paper feed motor (not shown), the paper feed roller 25 of the unit B is driven in conjunction with the feed roller 8. A paper guide 31 is arranged to guide a sheet of paper P2 which has passed between the paper feed roller 8 and the pinch roller 9 and thence between the paper feed roller 25 and the pinch roller 26. A tray or paper receiver

32 receives the lower end of the sheet P2 when the latter is disposed in the sheet receiver 15. The paper guide 31 and the paper receiver 32 are fixed respectively to the side plates 22 of the unit B.

5 Therefore, a sheet of paper P2 can be passed between the roller 8 and the pinch roller 9, fed between the rollers 25 and 26 via the paper guide 31, and then stocked in the paper receiver 15, as shown by the chain dotted lines. At that time, the sheet of printed paper P2 will be mounted
10 in the paper receiver 15 with its printed surface facing inwardly (i.e. towards the base of the paper receiver 15) so that sheets of paper P2 can be superposed page by page when page printing is performed.

 The cover 18 can be opened to allow the auxiliary
15 paper feed unit B to be mounted in position or removed. Similarly, the cover 19 can be opened to allow an ink ribbon cassette (not shown), which is disposed behind the printing head 5, to be exchanged. Therefore, these mounting, removing and exchanging operations can be carried out
20 without difficulty.

 As described above in detail, a small opening 18b, 19b is provided in each cover 18, 19 on the upper housing surface, and the small opening 18b, 19b is further adapted to be closed by a small closure member 20, 21.

When the small closure member 20, 21 is opened, the sheet receiver 15 can be inserted into the housing through the small opening 18b, 19b and can be supported removably by the mounting means 18e, 19e provided adjacent the small opening 18b, 19b. Therefore, the opening area formed when the paper receiver 15 is used is minimized and consequently the transmission of the printing noise which is generated when the paper receiver 15 is used is reduced. Since the paper receiver 15 is inserted through a small opening into the housing 1, the height of the paper receiver 15 protruding from the upper housing surface is reduced and the paper receiver 15 is supported in the small opening, so that no additional space for the support of the paper receiver 15 is required.

C L A I M S

1. A printer having a housing within which is disposed a printing mechanism, the housing having at least one rotatable cover for opening and closing an aperture in the housing; the or each cover having an opening therein, through which may pass a sheet of paper, and a rotatable closure member for opening and closing the said opening in the respective cover; the or each cover having mounting means which, when the respective closure member is open, is adapted to provide a mounting for a removable paper receiving means.

2. A printer as claimed in claim 1 in which there are two rotatable covers.

3. A printer as claimed in claim 2 in which, when the paper receiving means is mounted in one of the said openings, the arrangement is such that, in operation, a sheet of printed paper is passed thereto with its printed surface facing outwardly, while when the paper receiving means is mounted in the other opening, the arrangement is such that, in operation, a sheet of printed paper is passed thereto with its printed surface facing inwardly.

4. A printer substantially as hereinbefore described with reference to and as shown in the accompanying drawings.



5. A printer comprising a printing mechanism, a housing for accommodating the printing mechanism, and a rotatable cover for opening and closing an opening in an upper surface of the housing, characterised in:

5 that the cover has a small opening through which a single sheet of paper printed by the printing mechanism is dischargeable, and

10 that a rotatable small cover is provided at the small opening for closing and opening the small opening, and a mounting means is provided for removably mounting a receiver which receives the printed sheet of paper when the small cover is open.

