July 30, 1940. W. E. SWIFT, JR 2,209,586

MANIFOLDING PROCESS AND MASTER SHEET THEREFOR

Filed March 4, 1938 2 Sheets-Sheet 1

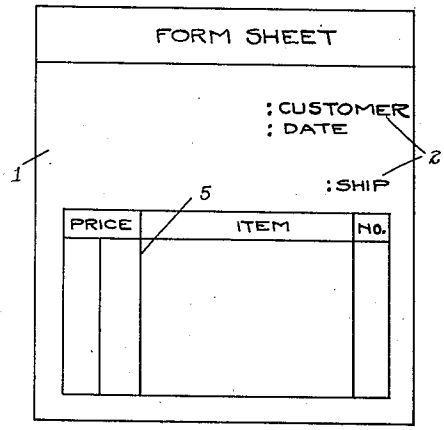


Fig. 1.

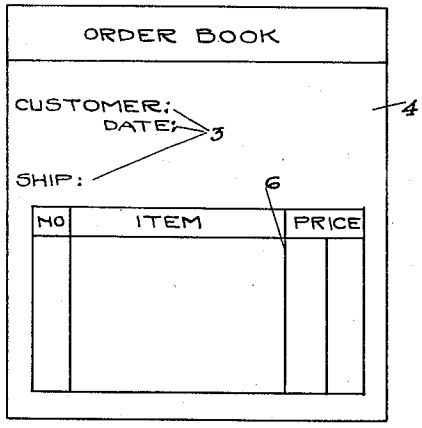


Fig. 3.

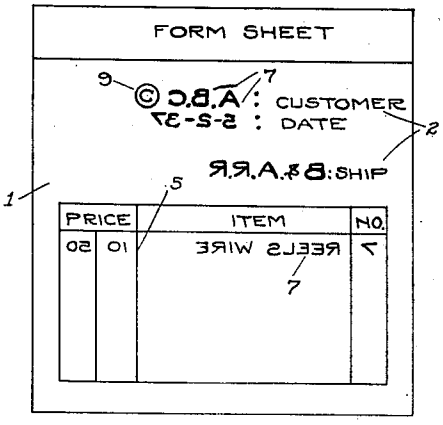


Fig. 2.

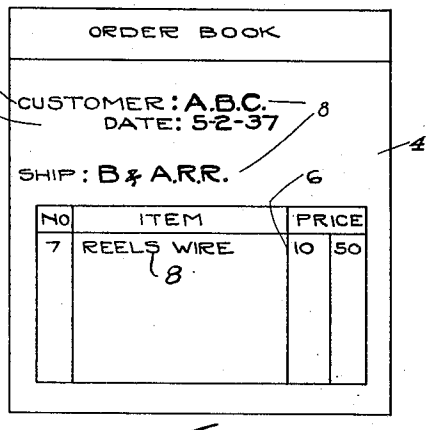


Fig. 4.

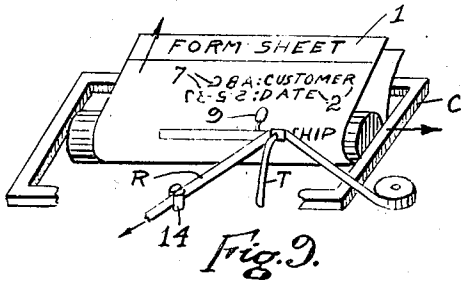


Fig. 9.

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July 30, 1940. W. E. SWIFT, JR 2,209,586

MANIFOLDING PROCESS AND MASTER SHEET THEREFOR

Filed March 4, 1938 2 Sheets-Sheet 2

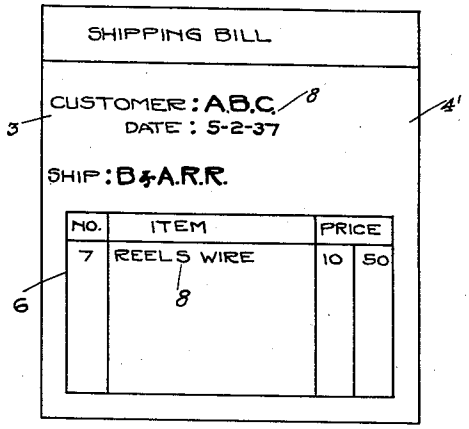


Fig. 5.

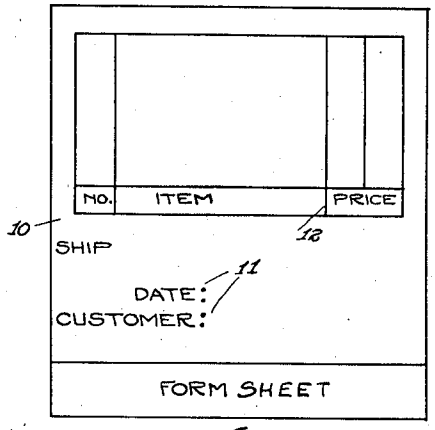


Fig. 7.

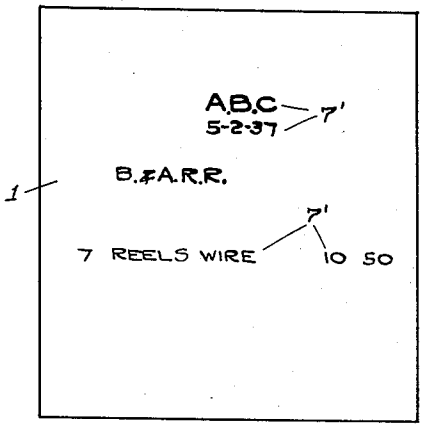


Fig. 6.

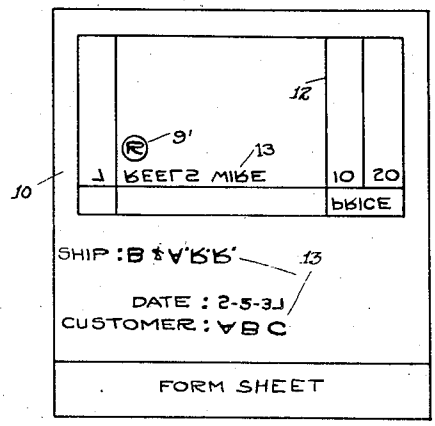


Fig. 8.

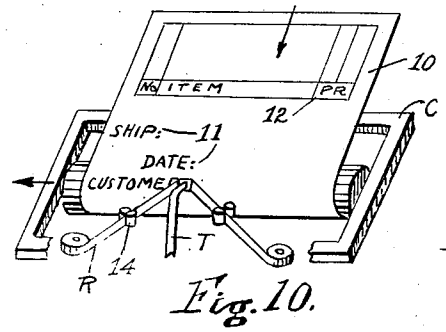


Fig. 10.

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Patented July 30, 1940

2,209,586

UNITED STATES PATENT OFFICE

2,209,586

MANIFOLDING PROCESS AND MASTER SHEET THEREFOR

Willard Everett Swift, Jr., Worcester, Mass., assignor to United States Envelope Company, Springfield, Mass., a corporation of Maine

Application March 4, 1938, Serial No. 194,001

3 Claims. (Cl. 101—149.5)

The present invention relates to the production of manifolding master sheets containing original character imprints, from which a multiplicity of copies may be conveniently made, as in hectographing.

Generally considered, hectographing involves the production by a suitable transfer medium, of character imprints in reverse or inverted form, from which impressions of the same characters in true form can be obtained by bringing moistened sheets successively in contact with the imprints. The hectograph principle of producing manifold copies is usually employed for the purpose of applying identical data to a relatively large number of similar printed forms, as in the ordering, billing and shipping of goods.

It has heretofore been the practice to produce original hectograph imprints on a manifolding master sheet by means of an ordinary typewriter, utilizing a special transfer sheet, carrying hectograph ink directly in contact with the back surface of the master sheet, inserted in the typewriter. Consequently, when characters are printed on the front side of the master sheet by means of the usual typewriter ribbon and type, reverse imprints of these characters, in hectograph ink, are simultaneously made on the back side of the same sheet, and from these reverse original hectograph imprints, a large number of directly reading impressions can be produced on duplicate copy sheets. It has been found that the production of original hectograph imprints, in the manner described above, involves the frequent handling of the hectograph transfer sheets, so that the ink thereon is liable to get on the fingers of the operator, and result in making smudgy copies. Furthermore, the use of whole transfer sheets to produce a limited number of similar imprints at only certain places on a form, is very wasteful of the transfer sheets, due to the localized wear on the sheets.

According to the present invention, there is provided an improved method of producing original hectograph imprints, by utilizing a special typewriter ribbon carrying hectograph ink to make imprints directly on the front face of a specially printed master form sheet, inserted in the typewriter. In order to produce reverse imprints on the master form sheet from which true impressions may be made, the invention contemplates the use of a typewriter provided with reverse type and a reversed carriage travel from left to right, with impressions starting from the right at the top of a sheet, or alternatively with upside down type, a standard right to left carriage travel, and with impressions starting from the left at the bottom of a sheet.

In the production and subsequent handling of master form sheets provided with original hectograph imprints, made in accordance with the present invention, it is entirely unnecessary for the operator to handle the usual hectograph transfer sheet or any material coated with hectograph ink. Consequently, the desired number of manifold copies can be made from the original imprint on the master sheet, immediately following its production, without any time being lost by the operator in taking special precautions to prevent the smudging which usually results from handling transfer sheets carrying hectograph ink. The above and other advantageous features of the invention will hereinafter more fully appear from the following description considered in connection with the accompanying drawings, in which:

Fig. 1 is a front face view of a specially arranged master form sheet, to be used in accordance with the practice of the present invention.

Fig. 2 is a front face view of the sheet of Fig. 1, with original hectograph imprints applied thereto, in accordance with the invention.

Fig. 3 is a front face view of a blank order copy sheet for use with the master sheet of Fig. 2.

Fig. 4 illustrates the appearance of the sheet of Fig. 3, after impressions have been made thereon from the sheet of Fig. 2.

Fig. 5 is a front face view of a bill copy sheet, on which the same impressions have been made from the sheet of Fig. 2.

Fig. 6 is a rear face view of the sheet of Fig. 2, on which appear true images of the reverse imprints on the front face of the sheet.

Fig. 7 is a front face view of a modified master form sheet for the reception of original hectograph imprints.

Fig. 8 illustrates the manner of producing original hectograph imprints on the sheet of Fig. 7.

Fig. 9 is a fragmentary perspective view, illustrating the use of the sheet of Fig. 1 in a typewriter.

Fig. 10 is a fragmentary perspective view, illustrating the use of the sheet of Fig. 7 in a typewriter.

Like reference characters refer to like parts in the different figures.

Referring first to Fig. 1, there is shown a specially arranged master form sheet 1, providing form matter in the nature of printed indicia 2 corresponding to similar indicia 3 printed on a blank order copy sheet 4, such as is shown in

Fig. 3. It is to be noted that the general location of the indicia 2 on the sheet 1 is reversed with respect to corresponding indicia 3 on the sheet 4; that is to say, the indicia 3 near the left-hand edge of order copy sheet 4 is reproduced, with the same spacing, near the right-hand edge of master form sheet 1. Furthermore, the arrangement of printed lining 5 on the form sheet 1, to indicate columns for the reception of data, is reversed with respect to the arrangement of printed lining 6 on the copy sheet 4.

In carrying out the present invention, the master form sheet 1 is inserted in a typewriter, as shown in Fig. 9, in which the carriage C is adapted to move from left to right, in response to operation of the keys, as indicated by the arrow. Furthermore, this typewriter is provided with a ribbon R carrying hectograph ink, with the characters of the type T being reversed left to right, although the actual appearance of the keyboard of this typewriter is unaltered.

In filling out the master form sheet 1 that has been inserted in the typewriter, the operator strikes the keys as usual, but starts from the right-hand side on the sheet to type certain information, or fill-in matter, relating to the indicia 2 and lining 5, such as would be necessary in making out an order for goods. Owing to the travel of the typewriter slide from left to right, and the reversal of the type from left to right, as compared to an ordinary typewriter, the reversely printed characters 7, relating to the indicia 2 and lining 5, appear as in Fig. 2. These characters 7 are printed in hectograph ink, and read in reverse from right to left.

In order to produce true impressions from the hectograph characters 7 on the master form sheet of Fig. 2, it is now only necessary to turn over the sheet 1 and place its indicia 2 and lining 5 in register with the indicia 3 and lining 6 on the blank order copy sheet 4 of Fig. 3, that has been previously moistened with the proper fluid. This causes the reverse hectograph characters 7 to be reproduced on the sheet 4, as true characters 8, which, as shown in Fig. 4, are properly positioned with respect to the indicia 3 and lining 6, so as to read in the usual manner, from left to right. An identical result is obtained when the master form sheet 1 is turned over and placed in register with a moistened blank bill copy sheet 4', such as is shown in Fig. 5, so that any desired number of exact duplications of the characters 8 may be made on sheets similar to the blank order and bill copy sheets shown in Figs. 3 and 5.

In order to enable the operator to directly read the characters 7 as they are printed on the sheet 1, in response to operation of the keys, a small mirror 9, indicated in Fig. 2, may be mounted on a fixed part of the typewriter at the proper angle to the plane of the sheet, so that mirror images of the reversed characters 7 will appear as true characters. To permit convenient checking of the characters 7 after the entire master form sheet 1 has been typed, a sheet of ordinary carbon paper can be placed in the machine with the sheet 1, with its inked surface in contact with the back face of the sheet 1. When a sheet of carbon paper is so utilized, operation of the type to produce the reverse characters 7 on the front face of the sheet 1, will result in the simultaneous printing of the same characters in true form, on the rear face of the sheet 1, in association with printed indicia similar to that on sheet 4, if desired. Therefore, when the sheet 1 is turned over, preparatory to making impressions on the blank order and bill copy sheets 4 and 4', the reverse side of the sheet 1 appears as in Fig. 6, with the characters 7' in true form, so that they can be read directly from left to right and the data checked, before reproducing it.

Referring now to Figs. 7 and 8, there is shown a modified master form sheet 10, that provides form matter in the nature of indicia 11 and lining 12 that are transposed vertically with respect to the indicia 3 and lining 6 on the blank order copy sheet 4 of Fig. 3. That is to say, the indicia 3, located at the upper left-hand corner of order sheet 4, is reproduced as the indicia 11 in the lower left-hand corner of form sheet 10.

In utilizing the master form sheet 10, the sheet is placed in a typewriter having a standard carriage movement from right to left, as indicated by the arrow in Fig. 10. The type characters of this machine, however, are upside down, and in typing, the operator starts at the lower left-hand corner of the sheet 10, although typing from left to right, in the usual manner, with the sheet feed being downward, as indicated. The master form sheet 10, with upside down characters 13 typed thereon in hectograph ink, is shown in Fig. 8, from which it is evident that these characters can be read almost directly, although a mirror 9', just above a character 13, will show a true image. In order to reproduce the hectograph characters 13 appearing on the master form sheet 10, it is only necessary to turn over the sheet to bring its indicia 11 and lining 12 into register with the indicia and lining of a moistened order copy sheet, such as is shown in Fig. 3, whereupon the upside down characters 13 will be reproduced as true characters 8, as shown in Fig. 4 or 5.

In order to provide for uniform feed of the hectograph ribbon R, feed rolls 14 are provided, which are adapted to feed the ribbon a predetermined amount for each operation of a key. This uniform feed prevents waste of the ribbon which would otherwise occur with non-uniform feed by the usual mechanism for turning the rolls on which the ribbon is wound.

In the foregoing description and in the following claims, the term "hectograph imprint" has been used to designate any original imprint of a character, in reverse or inverted form, by a transfer medium capable of directly producing manifold impressions of the same character, in true form.

I claim:

1. The herein described method of making a master sheet adapted for the duplicating transfer of fill-in matter impressed thereon to copy sheets having printed form matter, which consists in providing such sheet on its front face with corresponding form matter printed to read directly but in reversely positioned arrangement relative to the printed form matter on said copy sheets, placing such sheet in a typewriter having special type characters and a ribbon which carries the duplicating transfer means, and typing on said front face the desired fill-in matter in appropriate relation to the printed matter, so that by subsequent front-to-front registry of said master sheet with each copy sheet the typed fill-in matter is transferred to the copy sheet in proper relation to the printed form matter thereon.

2. The herein described method of making a master sheet adapted for the duplicating transfer of fill-in matter typed thereon to copy sheets having printed form matter, which consists in providing such sheet on its front face with corre-

sponding form matter printed to read directly but arranged reversely from left to right relative to the printed form matter on said copy sheets, placing such sheet in a typewriter whose characters type in the negative presentation and whose ribbon carries the duplicating transfer means, and typing on said front face the desired fill-in matter in appropriate relation to the printed form matter, so that by subsequent front-to-front registry of such master sheet with each copy sheet, the negatively typed fill-in matter on said sheet is transferred in positive presentation to the copy sheet in proper relation to the printed form matter thereon.

3. The herein described method of making a master sheet adapted for the duplicating transfer of fill-in matter typed thereon to copy sheets having printed form matter, which consists in providing such sheet on its front face with corresponding form matter printed to read directly, but reversed from top to bottom relative to the printed form matter on said copy sheets, placing such sheet in a typewriter having upside down type characters and a ribbon which carries the duplicating transfer means, and typing on said front face the desired fill-in matter in appropriate relation to the printed form matter, so that by subsequent front-to-front registry of such master sheet with each copy sheet the typed fill-in matter is transferred to the copy sheet in proper relation to the printed form matter thereon.

WILLARD EVERETT SWIFT, JR.