

March 9, 1943.

J. ZALKIND

2,313,285

SORTABLE MULTIPLE FORM

Filed May 31, 1941

2 Sheets-Sheet 1

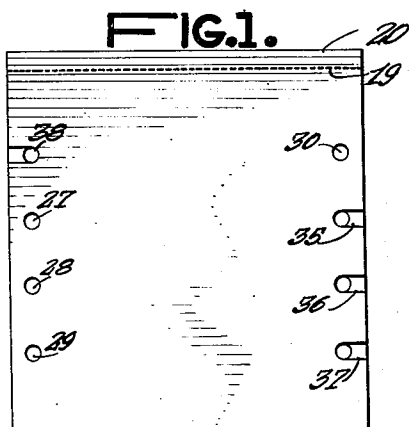
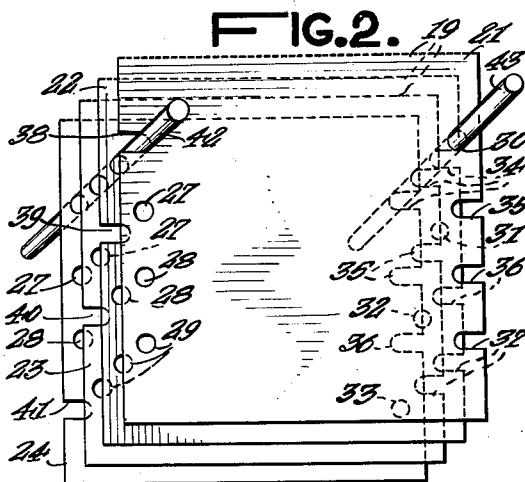


FIG.3.

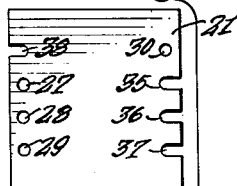
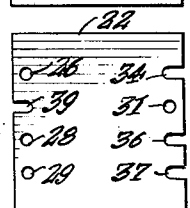
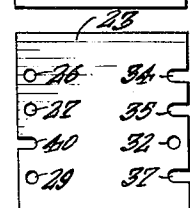
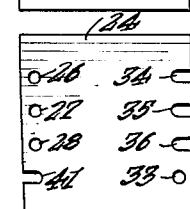
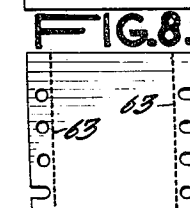


FIG.4. FIG.5. FIG.6. FIG.7.

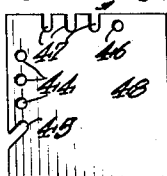
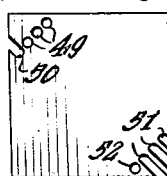
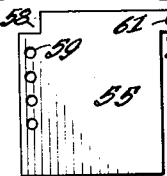
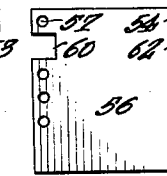


FIG.10.

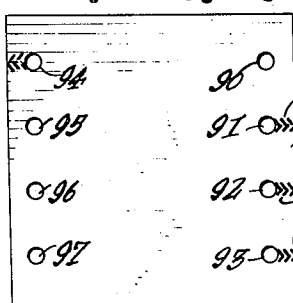
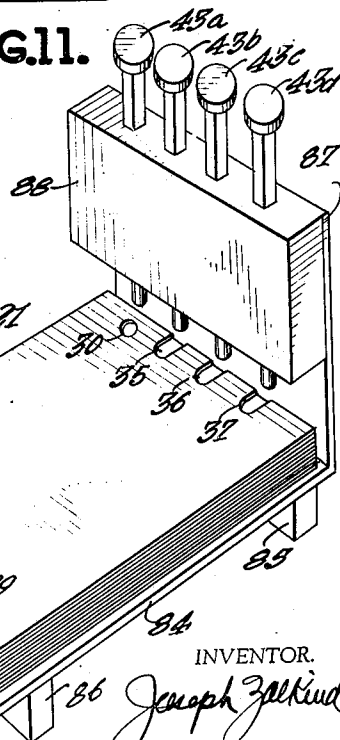
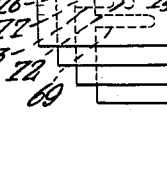


FIG.11.



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2 Sheets-Sheet 2

FIG. 12.

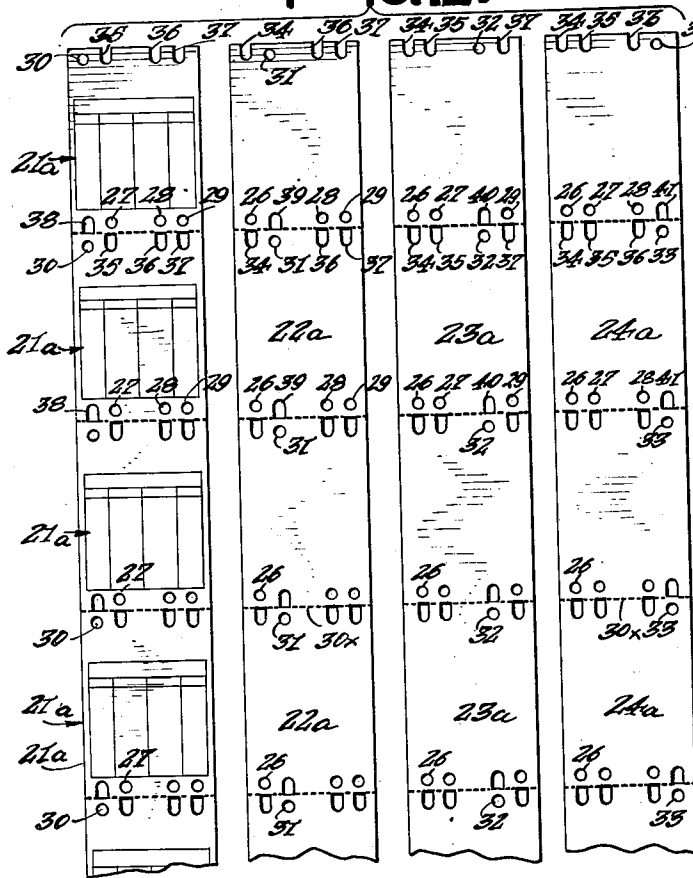


FIG. 13.

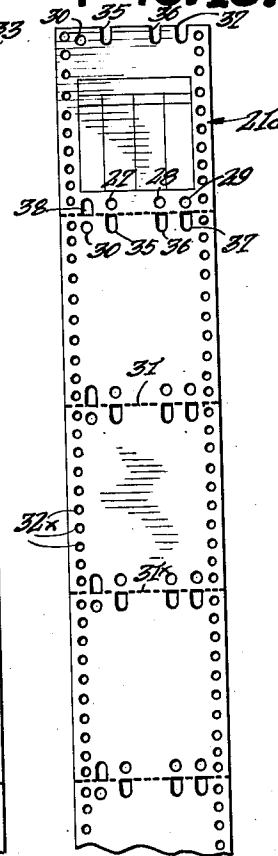


FIG. 14.

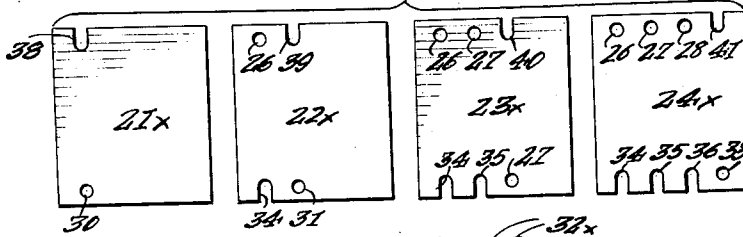


FIG. 16.

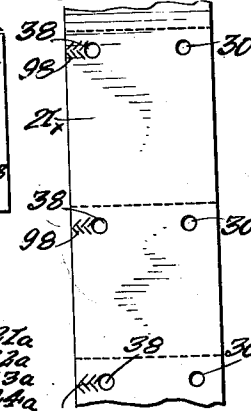
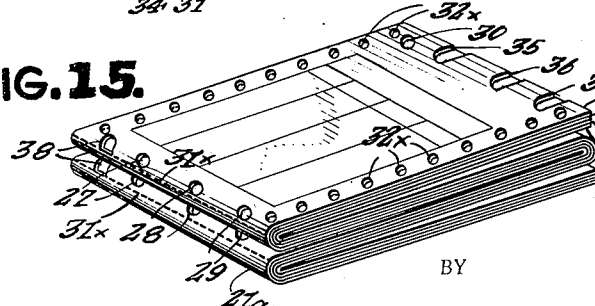


FIG. 15.



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UNITED STATES PATENT OFFICE

2,313,285

SORTABLE MULTIPLE FORM

Joseph Zalkind, New York, N. Y.

Application May 31, 1941, Serial No. 396,058

9 Claims. (Cl. 282-20)

This invention relates to a system for sorting or separating sheets of printed forms of one kind from a pile of forms of a different kind and it is particularly adaptable for separating such multiple forms as the bound manifold books, the so-called "snapout" carbon forms.

This invention has also for its object the provision of forms suitable for use in the system, and means for selective separating of said forms. It is especially adapted to sorting sheets of paper or printed forms which are used in multiple forms interleaved with carbon or transfer sheets in which two or more copies of the same matter are made at the same time. In present practice, the person who makes these records does not have the time, at the time that such records are made, to sort the various sheets out into separate piles, so that all the copies are placed together and each set is piled indiscriminately on top of the other. These piles are then sorted out by hand; the person who sorts these sheets must thus handle each sheet of paper separately and must segregate each sheet individually into its proper pile. All this work is very slow and laborious.

With my invention, the sheets of one particular kind are sorted in such a manner that the sheets of forms of another kind are left within the pile stack while the first sheets are withdrawn from the stack.

Forms of the general type herein referred to are used in practically all usual manners of ways and under a wide variety of conditions, such as those which are found in the office, the factory, stores and shipping establishments. It is often the wish, for instance, to avoid handling carbon paper, as used with such forms. And again, carbon paper tends to soil forms of the kind referred to, especially during manipulation, therefore, a further and double purpose is involved in this invention, according to which, the forms may be untouched by hand while being drawn from the pile or soiled, with the disclosure of my invention.

With the above indicated objects and advantages in view, as well as others which will hereinafter appear, the invention resides in certain novel constructions, methods of operation, and arrangements of parts, the essential features of which are herein clearly described, and fully illustrated in the accompanying drawings, in which:

Fig. 1 is a top plan view of a stack of forms constructed in accordance with this invention;

Fig. 2 is a separated view in perspective of

forms of Fig. 1, in which the members are spaced apart, for clarity, and with which operating pins or instruments are shown;

Fig. 3 is a bracketed top plan view of the forms of Fig. 2;

Figs. 4, 5, 6 and 7 are top plan views of sheets in which modifications over the first named figures appear;

Fig. 8 shows a business form with plural weakened lines therein;

Fig. 9 is an exploded view of a group of forms in perspective, embodying another modification;

Fig. 10 is a top plan view of another modified form sheet;

Fig. 11 is a view in perspective of a sheet selecting device having a base with sheets or forms thereon, and with holding selector pins;

Fig. 12 is a separated view of a multiple so-called "continuous-manifold" or "continuous-form." These forms may consist of a great number of separate continuous sheets (in this case there are four such sheets shown). Fig. 12 also shows the position of the holes and slots used for separating or sorting the forms, also, the perforations for tearing off the sheets from the rest of the continuous form.

Fig. 13 is a view showing the top sheet of the multiple "continuous-form" shown in Fig. 12. It shows the use of round perforations on both sides of the continuous form. These perforations are needed to register the forms when they are used in conjunction with a typewriter.

Fig. 14 is a separated view of a multiple form consisting of a plurality of sheets perforated and slotted and similar to the forms shown in Fig. 3.

Fig. 15 is showing the multiple continuous-form of Fig. 12 as it appears when all the sheets of the form are put together and are ready for use.

Fig. 16 is a view showing a multiple continuous-form utilizing the slot and perforation arrangement of the forms shown in Fig. 14 in combination with the tear off arrangement shown in Fig. 10.

Referring in detail to said drawings, individual forms 21, 22, 23, 24 are removed from a group or stack, as shown in Fig. 1, the stack having a binding 20, and perforated or weakened lines 19. The multiple forms of Figs. 1 to 3 are shown as illustrative, and other numbers of forms, more or less than four, may be used in a group or pack.

When the multiple forms are interleaved with carbon sheets, as is sometimes the case, these sheets may be withdrawn with the binding, al-

though in other cases the carbon sheets, not shown, may be perforated in opposite margins, in the same manner as the forms, and then such carbon sheets may be withdrawn selectively, in the same manner as said forms.

In the top sheet 21, Figs. 1 to 3, is provided in its holding side, a slot 38 and perforations or apertures 27, 28, 29, and on the opposite or pulling side of said sheet transverse to said slot and apertures, is a marginal line of openings, consisting of an aperture 30, and slots 35, 36, 37.

The second sheet 22 is provided on its holding side with a perforation 26, a slot 39 and perforations 28, 29. On its pulling side the sheet 22 has a slot 34 in line with the perforation 26, a slot 36, in line with the perforation 28, and a slot 37 on the transverse line of the perforation 29.

On the holding side of the third sheet 23, are perforations 26, 27, a slot 40, and the perforation 29. On its pulling side the sheet 23 has a slot 34, on the line of the perforation 26, a slot 35 in line with the perforation 27, the perforation 32 on the line of the slot 40, and the slot 37 in line with the perforation 29.

The bottom sheet 24 has in the margin of its holding side apertures 26, 27, 28, and a slot 41, and in the opposite margin of the sheet 24, are a slot 34, slots 35 and 36, as well as the aperture 33, the latter being opposite the slot 41.

During the selecting or sorting operation, all of the sheets are maintained entirely flat and mutually engaged, so that lifting or disturbing any portion of a sheet, such as a margin, from its flat engaging position, as differing from sorting operations heretofore practised, is unnecessary and not called for. In this way, as an advantage of compact arrangement, a stack of sheets may be placed upon a base, as of a machine, and immediately above the pack, or even contacting with the top member thereof, another part, such as a plate or bar of the mechanism, may be disposed, as hereinafter additionally brought out.

Referring to Fig. 2, as one or a primary instance of operation, when it is desired to pull out a sheet 21 from the pack, a holding pin 42 is placed in the pile through the slot 38 of said sheet, and through the perforations 26 of the sheets 22, 23, 24. A pulling pin 43 is placed in the pile through the perforation 30 of the sheet 21, and through the slots 34 of the sheets 22, 23, 24. Upon moving the pin 43 transversely, the sheet 21 only is pulled out, because the other three sheets have slots therein and therefore remain in the pile.

The reason why the three sheets last mentioned remain in the pile is that they have therein apertures 27, 28, 29, in which is the holding pin 42, and this pin is movable transversely because of the slots 34 in the other three sheets 22, 23, 24.

To pull out the sheet 22, the holding pin 42 is placed in the set of perforations 27 and slot 39, on the holding side of the sheets, and the pulling pin 43 is inserted through the perforation 31 and through the set of slots 35. Since the slot 39 is on the holding side of the sheet 22, on this transverse line, and the perforation 31 being on the pulling side, when the pin 43 is moved transversely said latter sheet only is withdrawn.

By placing the holding pins in the apertures 26, 27, 29 of the sheet 23, which has a slot 40 on the third transverse line, on the holding side

and by using the drawing pin in the aperture 32 on the drawing side of said line, the sheet 23 may be withdrawn, said sheet 23 having on the drawing side the slots 34, 35, 37.

Likewise, the sheet 24, having on the drawing side of the fourth transverse line the aperture 33, with the non-obstructing slot 41 on the holding side of said line, may be withdrawn, since in said sheet, the slots 34, 35, 36, are non-obstructing, allowing it to come out, and the apertures 29, with the holding pin retain the sheets 21, 22, 23.

The sheets or forms 21, 22, 23, 24 may be pulled out in any other order than that given above.

The slots and perforations on one side or end of a sheet need not necessarily be on the same transverse lines with those on the opposite end, nor is it necessary that the perforations on the holding side be in the same order or sequence as the corresponding slots on the pulling side or vice versa.

In actual practice, many multiple forms having predetermined perforated and slotted sheets are stacked in a pile, and then, first, all the sheets of one kind, instead of just one sheet as in the example given above, are withdrawn at one operation from the pile, after which all the other sheets of another kind are withdrawn, and so on until all the sheets of the different kinds in the pile are sorted.

In the alternative form of sheets, one of which is shown in Fig. 4, the holding perforations 44 and slots 45, in sheet 48, are along one edge, and the pulling perforation 46 and slots 47 are along an adjacent edge. The slot 45 is shown inclined, because with the holding pin in it and the pulling pin in perforation 46, the latter pin must be moved in a diagonal direction, relative to the rectangular form, as shown by the arrow, to pull out the sheet 48.

As in the alternative form shown in Fig. 5, the holding and pulling perforations and slots are at diagonally opposite corners of the sheet. Perforations 49 and slots 50 are at the holding corner, and slots 51 and perforation 52 are at the pulling corner.

In the alternative form shown in Figs. 6 and 7, tabs and cut-outs are used. Instead of using holes and slots on the pulling side, tabs such as those shown at 53 and 54 may be used as thumb-grips. Considering, by way of example, that the stack contains two forms, form 55 and form 56, when it is desired to pull out form 55 from the stack, a holding pin 42 is inserted through a perforation 57 and into the cut-out 58, and the tab 53 is pulled upon. When it is desired to pull out the form 56, the holding pin 42 is placed into the perforation 59 and into the cut-out 60, and then the tab 54 is pulled upon. Instead of pulling upon the tabs by gripping them, they can be provided with perforations 61 and 62, and a pulling pin 43 inserted into said perforations for the withdrawal of the forms.

In Fig. 8, a form is used similar to that shown in Fig. 3, sheet 24, as far as the slots and perforations are concerned, but with the addition of weakening lines 63, so that after the forms are sorted from a stack, the portions with the slots and perforations can be torn off.

The stack of forms shown in Fig. 9 embody the same principles as those already described, but these forms must be removed in a predetermined order. The advantage of this arrangement is that all of the slots and perforations may be located

at or near the top edge, the bottom edge, along some unused line, or at any other convenient location, leaving practically the full width, or length of the sheet for recording, writing or other uses. In the stack, the bottom form 64 must first be removed, then the third form 65, then the second form 66 and lastly the top form 67.

The bottom form 64 is provided with a perforation 68 on its pulling side, and with a slot 69 on its holding side. Form 65 is provided with a perforation 70 just inside of and on a line with a slot 71 on its pulling side, and with a perforation 72 just inside of and on a line with a slot 73 on its holding side. When the forms 64 and 65 are lined up, the slot 71 extends over the perforation 68, and the perforation 72 comes over the inner end of the slot 69. Form 66 is provided with a perforation 74 just inside of and in line with a slot 75, on the pulling side, and with perforations 76 and 77, just inside of and in line with a slot 78, on the holding side. When the forms 64, 65 and 66 are lined up, the slot 75 comes over the perforations 68 and 70 and slot 71; the perforation 76 and slot 78 come over the slot 73, and the slot 69, and perforation 77 come over perforation 72, and slot 69.

The form 67 is provided with a perforation 79 just inside of and in line with a long slot 80, on its pulling side, and with perforations 81, 82 and 83 in a transverse line on its holding side. When the forms 64, 65, 66 and 67 are lined up in a pile, the slot 80 comes over the perforations 68, 70 and 74, the slots 71 and 75, and perforation 81 comes over the slots 78, 73 and 69; the perforation 82 comes over perforation 76 and slots 73 and 69, and the perforation 83 comes over the perforations 77 and 72 and slot 69.

When it is desired to separate the stack shown in Fig. 9, a holding pin, such as pin 42, Fig. 2, is placed into the perforations 83, 77, 72 and slot 69, and a pulling pin or rod such as pin 43, is inserted into perforation 68, passing through slots 80, 75 and 71. Moving the pulling pin now transversely to the right withdraws form 64. The next form to be removed of the three remaining forms is form 65. The holding pin is inserted through perforations 82, 76 and the slot 73, and the pulling pin is inserted into perforation 70, passing through the slots 80 and 75. Pulling transversely on the pulling pin removes form 65. The next form to be removed, of the two remaining forms, is form 66. The holding pin is inserted through perforation 81 and slot 78 and the pulling pin is inserted into perforation 74, passing through the slot 80. A transverse motion of the pulling pin now removes form 66.

To sort the pile of sheets by simple manually operated pins, particularly where a large pile is involved, with consequent difficulty in maintaining accurate register of all the sheets, in order to be able to make proper use of the perforations and slots, would be less convenient than to use a selector mechanism such as illustrated in Fig. 11.

Referring to Fig. 12, it illustrates an additional kind of multiple form, the so-called multiple "continuous-form" or the multiple "continuous-manifold." These forms when printed are arranged into long ribbon like formations and may consist of any number of separate individual sheets. After these continuous forms are assembled together they are put through the typewriter, with carbon paper between the sheets so that all the copies read alike. Later on the typewritten forms are torn off the rest of the continuous form. The forms shown in Fig. 12 are slotted and perforated

in the same manner as the forms shown in Fig. 3. The form 21a has slots and perforations similar to the form shown in Fig. 3. Likewise the form 22a of Fig. 12 has the same arrangement of holes and slots as those of form 22 and so on up to the form 24a of Fig. 12, and form 24 of Fig. 3. Fig. 12 also shows that each separate sheet or bill is separated from the next bill through a perforated line 30x. This is needed to facilitate the tearing off of the already printed forms from the rest of the "continuous-form." The perforations 30x are arranged right next to the slots and holes of the forms. When the separate sheets of the forms are torn off the rest of the "continuous-form" they look just like the forms shown in Fig. 3.

In Fig. 13 there is shown a form similar to the one shown in Fig. 12. In this case two rows of round holes 32x are provided on both sides on the long edge margin of the form. These holes serve to register with similar holes provided on the other forms of the continuous set. This arrangement is very practical when the form is used in conjunction with the typewriter or printing press etc.

In Fig. 14 there is shown an additional modification of the sheet form as shown in Fig. 3. In this case instead of providing equally spaced slots and perforations on all the sheets the first and topmost sheet 21x has only one slot 38 and one perforation 30. The second sheet 22x has the slots 39 and 34 and the perforations 26 and 31. The third sheet has the perforations 26, 27, 29 and the slots 34, 35 and 40. The fourth and last sheet has the perforations 26, 27, 28, 33 and the slots 34, 35, 36 and 41. It can be seen that these forms are very much like the forms shown in Fig. 3 only that for better appearance the top sheet has only one hole and one perforation. In this case each next sheet has an extra slot and perforation, etc. It is understood that the continuous forms as shown in Fig. 12 and Fig. 13 can be provided also with similar arrangement of slots and perforations as shown in Fig. 14. These slots and perforations can be punched while the continuous forms are being printed, after printing or in any other manner.

In Fig. 15 is shown a perspective view of the continuous form of Fig. 12 as it looks after being assembled together. The form 21a is the topmost. Then comes the form 22a, 23a and finally the form 24a. It is understood that more than four forms can be provided.

In addition it can be seen that the perforations 31x are located at the folding edge of the continuous-form" shown in Fig. 15 and that the slots and holes are located right next to the folding edge. After the forms are typewritten upon and are torn off the rest of the "continuous-form," they will look just like the forms shown in Fig. 3. After the forms are torn off the rest of the "continuous-form" they are piled into stacks and sorted or separated in the usual manner as it has been described for the forms shown in Fig. 3.

Referring to the selector mechanism as shown in Fig. 11, it consists of a base plate 84 which is supported upon legs 85 and 86. An upright member 87 is attached to one end of the base plate 84. A box like member 88 is attached to the upright member 87 and serves as a bearing surface for the separator holding pins 43a, 43b, 43c, 43d which are similar in construction to the holding pin 43 shown in Fig. 2. The sheets to be separated are placed upon the base plate 84 and a separator pulling pin 42a is used to pull the sheets

off the pile. The pin 42a is similar to the pulling pin 42 shown in Fig. 2. The action of separating the sheets from the pile is exactly the same as described for Figs. 2 and 3.

In Fig. 10, is shown another modification of the sheet 21 shown in Fig. 3. In this case the sheet is provided only with perforations 90, 91, 92 and 93 on its right side and with perforations 94, 95, 96 and 97 on its left side. In place of slots there is provided a number of incisions 98, located at the edge of the sheet, facing away from the perforations 91, 92, 93, 94 and 95. The incisions 98 weaken the paper conjoining the perforation so that when the pin 42 is forced against the perforation the paper splits open and allows the passage of the pin. It is understood that many other kinds of incisions from the one shown in the drawings can be used. These incisions are punched to the form at the time the form is printed or thereafter but they must be of the kind not visible. This arrangement is used in cases where it is required to eliminate the use of slots and when the edge of the sheet has to appear unbroken before it is used.

Variations may be resorted to within the scope of the invention and parts of the improvements may be used without others.

Now having described my invention what I claim is:

1. A continuous form comprising an elongated strip of paper, said elongated strip being subdivided into a plurality of separate sheets, perforations located upon the subdivisions aforesaid, and a number of slots and apertures located adjacent and on either side of said perforations, the slots and apertures of the one side of perforations being in line with the slots and apertures upon the other side of the perforations aforesaid.

2. A continuous form comprising an elongated strip of paper, said elongated strip being subdivided into a plurality of separate sheets by means of perforations, a number of slots and apertures located adjacent and from either side of said perforations, said slots contacting said perforations while said apertures located at a distance away from the perforations aforesaid.

3. A continuous form comprising an elongated strip of paper, said elongated strip being subdivided into a plurality of separate sheets by means of a perforated line, a number of slots and apertures located adjacent on either side of said perforated line, said slots contacting said line while said apertures located at a distance away from said line, said slots and apertures upon one side of said line being in alignment with the slots and apertures located upon the other side of the perforated line aforesaid.

4. A continuous form comprising an elongated strip of paper, said elongated strip being subdivided into a plurality of separate sheets by means of a perforated line, a number of slots and apertures located upon the sheets adjacent and on either side of said perforated line, the slots

of said sheets contacting said line while the apertures of said sheets located at a distance away from said line, the slots and apertures of one sheet being in alignment with the slots and apertures of the other sheet.

5. A form comprising an elongated strip of paper, said strip being subdivided by means of perforated lines into continuous separate sheets, a plurality of slots and apertures being located upon the sheets on either side of said perforated lines, said slots and apertures being adjacent to said line, said slots contacting said line while said apertures being located at a distance away from said line, the slots and apertures of the sheet located on one side of said line being in alignment with the slots and perforations located upon the sheet on the other side of the perforated line aforesaid.

6. A continuous form comprising an elongated strip of paper, said strip being subdivided by means of perforated lines into a row of separate sheets, a number of similar elongated sheets of paper and carbons being interposed and located below said strip, slots and apertures located upon said interposed sheets of paper and carbons, said slots and apertures being adjacent to said perforated lines, the slots and apertures upon the interposed sheets and carbons on one side of said line being in alignment with the slots and apertures of the interposed sheets and carbons on the other side of said line.

7. A continuous form comprising elongated strips of paper interposed with carbons, said strips being subdivided by means of perforated lines into a row of separate sheets, a plurality of slots and apertures being located adjacent said perforated lines and from either side thereof, the slots and apertures located on one side of the perforated lines being in alignment with the slots and apertures located on the other side of said lines.

8. A continuous form comprising elongated strips of paper interposed with carbons and having holes located upon the margins of said strip, said strips being subdivided by means of perforation lines into a row of separate sheets, a plurality of slots and apertures being located adjacent and on either side of said perforated lines, the slots and apertures of the sheets located upon one side of said lines being in alignment with the slots and perforations upon the sheets on the other side of said lines.

9. A continuous form comprising elongated strips of paper interposed with carbons, said strips being subdivided by means of perforation lines into a row of separate sheets, apertures located upon the margins of said sheets, V shaped incisions included upon said forms and located adjacent said apertures, said incisions facing away from said apertures towards the marginal edge of the form aforesaid.

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