Oct. 4, 1955 J. G. KERR 2,719,735

SNAP-OUT MANIFOLDING UNIT

Filed Feb. 10, 1953 2 Sheets-Sheet 1

Fig. 1.

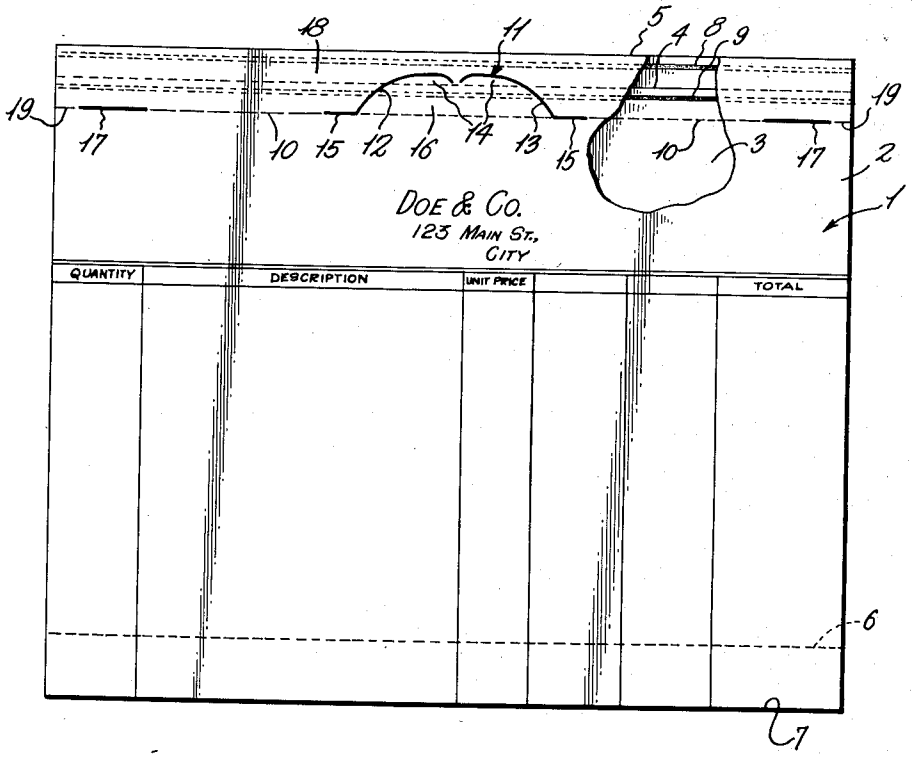
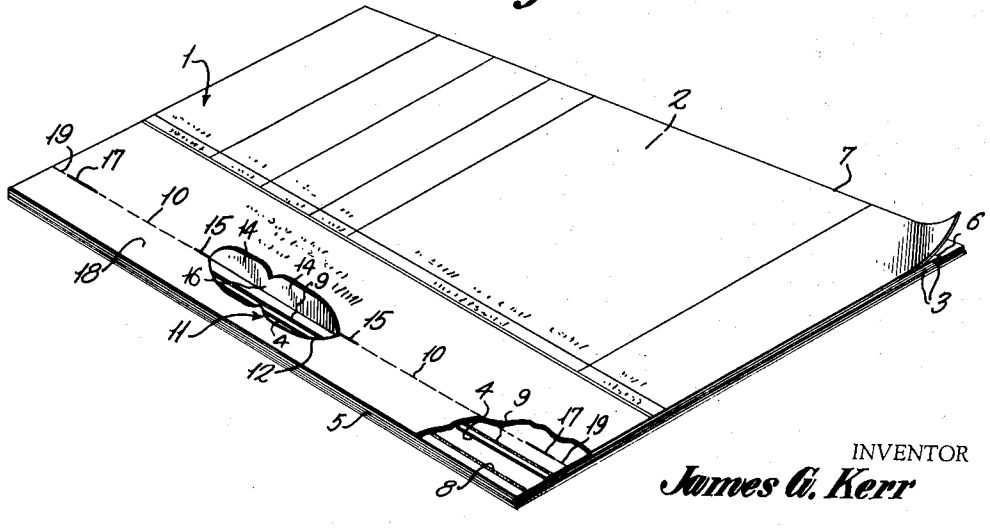


Fig. 2.



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Fig. 4.

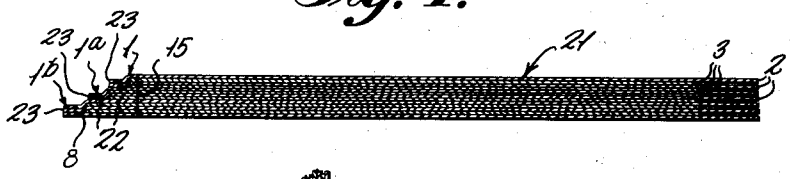


Fig. 5.

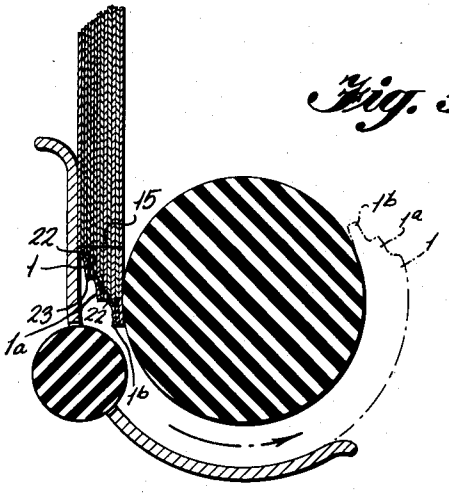


Fig. 3.

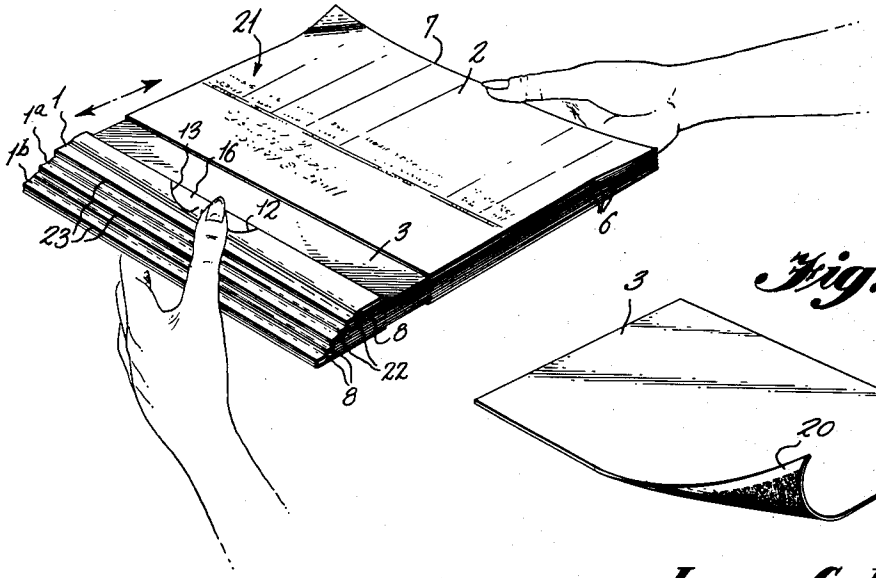


Fig. 6.

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SNAP-OUT MANIFOLDING UNIT

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Application February 10, 1953, Serial No. 336,051

10 Claims. (Cl. 282—24)

This invention relates to snap-out manifolding units, having for its general object improvements in the construction of known types of manifolding units in which, although the stub may be torn off to free the tops of the sheets for the purpose of making erasures, congruent tabs remain at the heads of the sheets of the unit, providing a fingerhold whereby the snap-out function of the unit may be performed. This known type of manifolding unit is disclosed in my Patent No. 2,394,553, granted February 12, 1946.

Another object of the invention is to provide a snap-out manifolding unit in which the upper margins of the inter-leaved carbon sheets are incorporated in the stub and the line of weakness which divides the stub from the body of the unit and is impressed through all sheets, both form sheets and carbons, extends rectilinearly the full width of the unit, with a by-passing arcuate portion at the middle delineating a tab, the rectilinear portion of the line of weakness which subtends said arcuate portion, permitting the tabs to be separated cleanly from the top edges of the letter sheets in the snap-out operation, whether this be performed when or after the stub has been removed.

A further object of the invention is to provide a snap-out unit as described, in which the line of weakness in its rectilinear portion includes slits near the ends, but terminating short of the ends, and slits extending laterally from the base of the tabs at both ends thereof, the rest of the rectilinear portion being in the form of sharp score lines or other patterns of weakness less pronounced than the slits, the arcuate portion which delineates the tabs being preferably slits defining a re-entrant tongue in the middle of the tabs, and being discontinuous at the apex of the tongues.

Still another object of the invention is to provide a snap-out unit as described, in which the rectilinear line of weakness is applied individually clear across all the sheets which comprise the form set, those on the printed sheet being applied in the printing of each sheet on the press and those on the carbon sheets being impressed concurrently with the coating operation, the sheets of the form set being then collated with the rectilinear lines of weakness in depthwise registry, the slits in the rectilinear lines of weakness and the tab delineating slits being then simultaneously die-pressed through all of the sheets of the form set.

A further object of the invention is the provision of a composite manifolding unit consisting of more than one form set, each set being a unit of the type described, the lines of weakness of all units being in depthwise registry and the stub of each extending upwardly beyond the stub of the one next in front, thereby providing the composite unit with a shingled upper end facilitating its insertion into the typewriter and by the same shingled construction providing means by which the several form units may be individually grasped and peeled off one from the other for individual handling, filing, transmittal, or later entry.

Other objects of the invention will appear as the following description of a practical embodiment thereof proceeds.

In the drawings which accompany and form a part of the following specification, and throughout the figures of which the same reference characters have been used to denote identical parts:

Figure 1 is a plan view of a snap-out manifolding unit embodying the principles of the invention, part of the front form sheet being broken away to show underlying structure;

Figure 2 is a perspective view of the manifolding unit shown in Figure 1, a lower corner of tne front form sheet being lifted to show the lower end of the immediately underlying carbon sheet, and one of the tabs being raised to show the upper margin of the underlying carbon sheet attached to the back side thereof;

Figure 3 is a perspective view of a modified form of the invention, comprising a plurality of units disclosed in Figure 1 with the stubs in shingled relationship, the view showing the units in course of having the carbons snapped out;

Figure 4 is a longitudinal section through the composite snap-out unit, taken along a line intermediate the tabs and a side edge of the unit;

Figure 5 is a cross-sectional view illustrating the insertion of the shingled stub into the typewriter, the broken lines indicating the composite unit when turned to the forward position in which the stub will be torn off for the purpose of making erasures;

Figure 6 is a perspective view of a carbon sheet showing the uncoated margin which is exposed on the back of the overlying form sheet, in the zone of the tab.

Referring now in detail to the several figures, and first to that form of the invention shown in Figures 1, 2 and 6, the manifolding unit **1** consists of a form set or sheaf of alternating interleaved form sheets **2** and carbon sheets **3**. The form sheets are congruently arranged, as are the carbon sheets. The upper edges **4** of the carbon sheets are at a distance below the upper edges **5** of the form sheets, and the lower edges **6** of the carbon sheets terminate above the lower edges **7** of the form sheets. The upper ends of all the form sheets are adhered together by means of the glue-lines **8**. Each carbon sheet is adhered along its top edge to the form sheet immediately above it by the glue-line **9**. The carbon coated side of the sheet, of course, faces rearwardly.

All the sheets of the unit, both the form and carbon sheets, are impressed with lines of weakness which register in a depth direction, consisting of a rectilinear portion **10** extending transversely of the unit from one side edge to the other, and a tab delineating portion **11** consisting of arcuate slits **12** and **13**, preferably symmetrical with respect to the medial longitudinal line through the unit, said slits curving abruptly upward from the rectilinear portion **10** from points at opposite sides of said medial line, and curving downward adjacent said medial line to form tongues **14**, said slits being discontinuous across the apices of said tongues. It is to be noted that the upper portions of the slits **12** and **13** extend upwardly beyond the carbon sheets, so that the tongues are formed solely on the form sheets. The portion **10** of the rectilinear line of weakness includes relatively short slits **15** starting at the ends of the base of the tabs **16**, and relatively longer slits **17** starting some short distance from the ends of said rectilinear portion. The purpose of the slits **17** is to shorten the length of the more mildly weakened unslitted portions of the lines of weakness which extend from the slits **15** to the side edges of the form sets; to eliminate the necessity of detaching the parts at their outermost extremities where the detaching "pull" is at its greatest angle, and therefore, less positive and accurate; to obviate the possibility of tear-

ing down into the form, thereby severing an upper corner or corners which in addition to mutilating the form, might remove essential dates, numbers, etc., and necessitate retyping, with incident wastage of material and time; to obviate the possibility of tearing upward into the stub at the outermost edges, leaving tufts or extended sections of the paper attached to the form sheets which later must individually be removed, with annoyance and loss of time; to limit the detaching action to a more central area of the line of severance where the pull is more nearly at right angles to the line of severance than toward the outer ends of the same. In explanation of this advantage it may be stated as the line of separation between the middle of the stub and the form extends outwardly in both directions and the angle of pull becomes more acute, a component of the pulling force tends to bulge the middle portion of the form out of the plane of the stub, producing a scissors-like action perpendicular to the plane of the stub, which becomes more acute as the line of severance progressively extends and which would cause tearing above or below the rectilinear line of weakness as the ends thereof are approached, if this scissors action were not relieved by the provision of the slits **17**.

That part of the unit which is above the tabs **16** and those parts laterally thereof of the rectilinear portion **10** of the line of weakness, is the stub **18**, which normally holds all of the sheets of the manifolding unit together, and which is to be torn off to free the individual form sheets **2** at the top to give access to those form sheets below the topmost, for making erasures.

In the normal intact condition of the manifolding unit the unweakened juncture of the apices of the tongues **14** with the corresponding tabs **16** holds the tabs in planiform relation to the adjacent parts of the units, and prevents them from curling outward and perhaps being torn off in the casual handling of the unit. The relatively mildly weakened terminal portions **19** of the rectilinear line of weakness resist the casual occurence of slits at these points, which could result in objectionable "dog ears" or further inadvertent severance of the stub from the body of the unit.

If no erasures have to be made, so that the manifolding unit is entire at the completion of the typing, the snap-out function is performed by the typist placing one hand over the stub **18** so as to grasp the tabs **16** between the thumb and first two fingers of the hand, at the same time grasping the lower ends of the form sheets with the other hand. By smartly pulling the hands apart, the snap-out of the carbon sheets is effected.

By this movement, since only the form sheets are tensioned, the carbon sheets remain attached to the stub and to the tabs. The tabs separate from the form sheets only, along that part of the line of weakness which delineates the base of the tabs. The slits **15** extend the line of severance between the stub and form sheets instantly to the adjacent ends of the intermediate mildly weakened portion of said rectilinear line of weakness, initiating a split in said portions at said adjacent ends. Since the pulling force acts upwardly upon said intermediate portions, the line of severance continues along said portions until the slits **17** are reached, whereupon, the pulling force is suddenly communicated to the terminal portions **19** of said rectilinear line of weakness, completing clean severance of the stub and including said tabs, from the body of the form sheets.

When erasures have to be made, the stub **18** is torn off after the unit has been brought to the front of the platen of the typewriter. Tearing off of the stub is best accomplished by grasping the stub to the left of the tabs **16**, in a right-handed operation, and pulling it in an upward and rightward direction. The tongues **14** are thus broken away from the tabs at their apices, while the contiguity of the slits **12** and **13** and the slots **15** respectively determines that the line of severance shall follow the rectilinear line of weakness outwardly from the base of the tabs rather than inwardly, breaking into the base of the tabs. The re-entrant curvature of the adjacent upper portions of the slits **12** directs the line of severance toward the apices of the tongues **14**, rather than inducing a tear in an upward direction through the narrow portion of the stub that overlies the tabs.

After the stub has been removed, each letter sheet together with its attached carbon, will be a separate unit which units can be successively turned down away from the platen for making the erasures. The carbon sheets being attached to the tabs, enables the typist to leaf through only half as many sheets as would be required if they were separate, in order to find the place into which to insert her shield and the progressive position for erasure from part to part, before making the erasure, and the two-ply thickness of the tabs makes the unit more readily fingered or leaved through than in the case of the single, and therefore, more flimsy individual sheets. Each tab to be handled, together with the attached carbon, is an integral unit, thereby gaining speed in the handling and reducing the possibility that some copy or copies may be skipped and the necessary erasures not made, as happens in commercial arrangements in which there are double the number of sheets to handle. The central location of the tab also promotes quick and easy selection of the particular part to be erased.

In some form sets it is desirable that certain typed information shall not appear on one or more of the copies. It is at present customary to print such copies with a black configuration or block-out in such areas upon which the carbon imprint of the information may fall which it is desired to suppress. Such expedient is frequently not an effective means of concealment, for the printer's ink and the carbon imprint may have different coefficients of reflection, so that the carbon imprint may be discerned by viewing the copy at an acute angle. In the manifolding unit of the present invention it is not necessary to provide printed block-outs for this purpose. Instead, the typist has merely to remove the carbon sheet from in front of the copy, by severing the tab, before typing the information which is to be suppressed with respect to said copy. To facilitate the selection of the carbon which is to be removed, the tab to which said carbon sheet is attached may be printed on its face with a suitable indicia or in a distinctive color of paper. When this operation is anticipated, the form is constructed so that the carbons terminate sufficiently above the bottom edges of the form sheets, as shown at **7** in Figure 1, so that the form sheets only and not the carbons, will be held by the pressure rolls of the typewriter, thus permitting carbons to be removed before the assembly is rolled back for completion of the typing, thereby deleting particular information in the particular areas of particular form sheets.

In some business systems the form set is only partially typed in one department and all or part transferred to another department for completion, the carbons being necessarily retained in one or more units until completion, and the snap-out being performed in the final operation. In such cases, if erasures have to be made in the first typing operation so that the stub is removed, the tabs afford means through which a staple may be inserted for holding the parts of the unit, including the carbons, together while being passed from one department to the other. If erasures have to be made by the typist in the second operation or department, she removes the staple, freeing the tabs which may then be independently turned forward in the manner previously described.

In order to avoid soiling the fingers by contact with the coated face of the carbon sheet which would be exposed at the back of each tab, in the event that carbon sheets were used which are coated all over, it is preferred to employ carbon sheets such as the one shown in Figure 6 which has an uncoated area **20** along the top, including the portion which is incorporated in the tab.

Figures 3, 4 and 5 disclose a modified form of the invention in which a composite unit **21** is formed by uniting a plurality of form sets **1**, **1***a* and **1***b*, each of which is structurally similar to the one disclosed in Figures 1, 2 and 6.

These are arranged one upon the other in such manner that the lines of weakness of all of the form sets register in a depth direction. The stubs, however, are of different depth measured in the longitudinal direction of the unit, each stub extending beyond the stub of the form set immediately above it. This gives a stepped or shingled taper to the leading end of the composite unit, facilitating its insertion behind the platen of the typewriter. The several form sets are united one to another by spot glue-lines **22** between successive stubs extending across the unit and located a short distance below the top edge of each anterior form set so as to provide free lips **23** by means of which each form set may be grasped at the top for detaching one from another by a peeling action, for final distribution. This avoids the necessity of counting the parts at the bottom edge of the composite unit to separate one or more form sets, or in forms of conventional construction, and ensures that no less nor more than all of the pertinent form sets are quickly selected and separated.

Prior to separation of the form sets the manipulations to which the structure of the composite unit lends itself are the same as disclosed in connection with the single form set unit.

While I have in the above description disclosed what I believe to be a preferred and practical embodiment of the invention, it will be understood by those skilled in the art that the specific details of construction and arrangement of parts, as shown, are by way of illustration and not to be construed as limiting the scope of the invention.

What I claim is:

1. Snap-out manifolding unit comprising a form set including a plurality of interleaved form sheets and carbon sheets, the bottom edges of said carbon sheets terminating short of the bottom edges of said form sheets, upper glue-lines between said form sheets along their top margins pasting them together at the top, lower glue-lines extending transversely of said unit at a distance below said upper glue-lines and lying between each form sheet and the next underlying carbon sheet uniting said form sheet with said carbon sheet, said unit being impressed with a rectilinear transverse line of weakness below said lower glue-lines, extending substantially from one side edge to the other of said unit and depthwise through all of said form sheets and carbon sheets, a tab-delineating line of weakness below said upper glue-lines extending upward from said rectilinear line of weakness and intersecting said lower glue-lines, having its ends meeting said rectilinear line of weakness at spaced points remote from the side edges of said unit, said tab delineating line of weakness being impressed through all of said form sheets and carbon sheets whereby the delineated tabs are congruent, each including united portions of a form sheet and the next underlying carbon sheet, and being crossed at their base by a portion of said rectilinear line of weakness.

2. Snap-out manifolding unit as claimed in claim 1, said tab-delineating line of weakness including arcuate slits beginning at the rectilinear line of weakness and being discontinuous at an intermediate point in the length of said tabs, said rectilinear line of weakness including slits laterally of the base of said tabs communicating with said arcuate slits, and slits adjacent the edges of said unit terminating short of said edges, all of said slits extending depthwise through the sheets of said unit.

3. Snap-out manifolding unit comprising a form set including a plurality of interleaved form sheets and carbon sheets, the bottom edges of said carbon sheets terminating short of the bottom edges of said form

sheets, upper glue-lines between said form sheets along their top margins pasting them together at the top, lower glue-lines extending transversely of said unit at a distance below said upper glue-lines and lying between each form sheet and the next underlying carbon sheet uniting said form sheet with said carbon sheet, said unit being impressed with a rectilinear transverse line of weakness below said lower glue-lines, extending substantially from one side edge to the other of said unit and depthwise through all of said form sheets and carbon sheets, a tab-delineating line of weakness below said upper glue-lines extending upward from said rectilinear line of weakness and intersecting said lower glue-lines, having its ends meeting said rectilinear line of weakness at spaced points equidistant from the medial longitudinal line of said unit, said tab delineating line of weakness being impressed through all of said form sheets and carbon sheets whereby the delineated tabs are congruent, each including united portions of a form sheet and the next underlying carbon sheet, and being crossed at their base by a portion of said rectilinear line of weakness.

4. Snap-out manifolding unit as claimed in claim 3, said tab-delineating line of weakness including arcuate slits beginning at said rectilinear line of weakness and being discontinuous adjacent said medial line, said rectilinear line of weakness including slits laterally of the base of said tabs communicating with said tab-delineating slits, and slits adjacent the sides of said unit terminating short of said sides, all of said slits extending depthwise through said unit.

5. Snap-out manifolding unit as claimed in claim 3, said tab-delineating line of weakness including reversely curved similar slits beginning at said rectilinear line of weakness comprising convex portions extending upwardly from said rectilinear line of weakness toward said medial line, and re-entrant portions at opposite sides of said medial line mutually convergent with respect thereto, the adjacent ends of said reversely curved slits being spaced apart.

6. Snap-out manifolding unit as claimed in claim 1, said carbon sheets each having an uncoated area at the top including the portion which is incorporated in the tab.

7. Snap-out manifolding unit as claimed in claim 3, said carbon sheets each having an uncoated area at the top including the portion which is incorporated in the tab.

8. Composite snap-out manifolding unit comprising a plurality of form sets arranged one upon another, each including a plurality of interleaved form sheets and carbon sheets, in which the bottom edges of said carbon sheets terminate short of the bottom edges of the form sheets, each form set having upper glue-lines between said form sheets along the top pasting said form sheets together at the top, lower glue-lines extending transversely of each form set at a distance below the upper glue-lines and lying between each form sheet and the next underlying carbon sheet, uniting said form sheets with said carbon sheets, the lower glue-lines of all of said form sets being in depthwise registry, all of said form sets being impressed with a rectilinear transverse line of weakness below said lower glue-lines extending from one side edge to the other of said composite unit and being in depthwise registry through all of the form sheets and carbon sheets of said unit, a tab-delineating line of weakness below the upper glue-lines of all of said form sets extending above said rectilinear line of weakness and intersecting said lower glue-lines, having its ends meeting said rectilinear line of weakness at spaced points remote from the side edges of said unit, impressed through all the form sheets and carbon sheets of said unit in depthwise registry whereby the delineated tabs are congruent, each including united portions of a form sheet and the next underlying carbon sheet, and being crossed at their base by a portion of said rectilinear line

of weakness, the parts of said form sets above said tabs and the portions of said rectilinear line of weakness laterally thereof constituting stubs, the stub of one form set being longer than the stub of the form set next adjacent, giving a shingled taper to the upper end of said composite unit, said form sets being united by transverse glue-lines between said stubs.

9. Composite snap-out manifolding unit as claimed in claim 8, each of the glue-lines which unite said form sets being a short distance below the top of the shorter of the adjacent stubs which it unites.

10. Snap-out manifolding unit comprising a form set including a plurality of interleaved form sheets and carbon sheets, the bottom edges of said carbon sheets terminating short of the bottom edges of said form sheets, upper glue-lines between said form sheets adjacent their top margins pasting them together at the top, lower glue-lines extending transversely of said unit at a distance below said upper glue-lines lying between each form sheet and the next underlying carbon sheet uniting said form sheet with said carbon sheet, said unit being impressed with a rectilinear transverse line of weakness below said lower glue-lines, extending substantially from one side edge to the other of said unit and depthwise through all of said form sheets and carbon sheets, a tab-

delineating line of weakness below said upper glue-lines extending upward from said rectilinear line of weakness and intersecting said lower glue-lines, said tab-delineating line of weakness being impressed through all of said form sheets and carbon sheets whereby the delineated tabs are congruent, each including united portions of a form sheet and the next underlying carbon sheet, the tab-delineating line of weakness together with the parts of said rectilinear line of weakness lying laterally of said tab being a line of severance, whereby in removing the part of the form set above it, to give access for making corrections, the glue-lines uniting the form sheets with the respective carbon sheets are confined to that part of said glue-lines intersecting said tabs.

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