Aug. 27, 1940. F. N. GUILBERT 2,213,123

METHOD OF MAKING MANIFOLDING STATIONERY

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Fig. 1

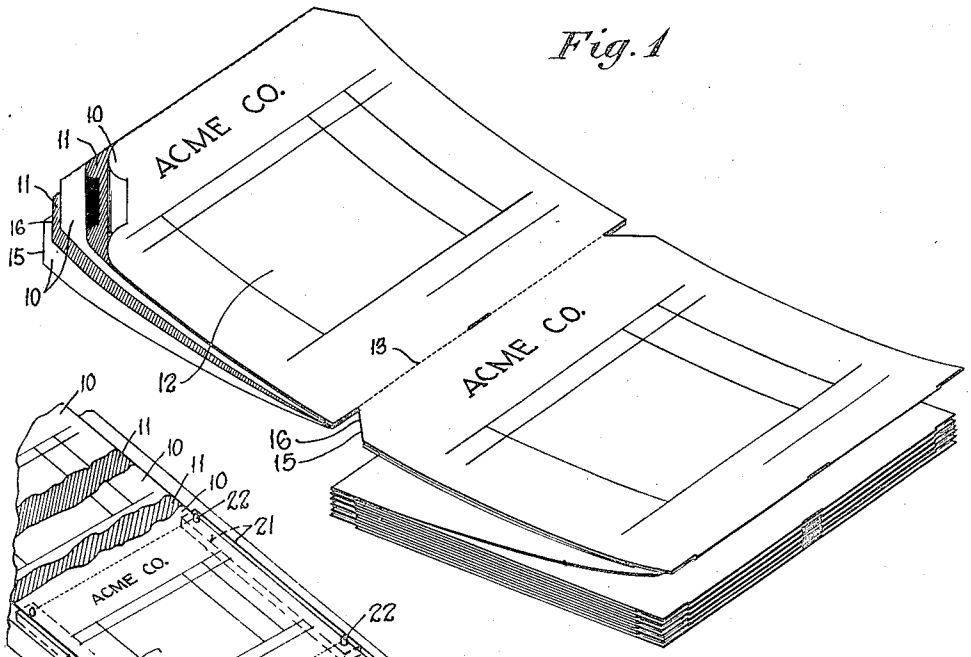


Fig. 2

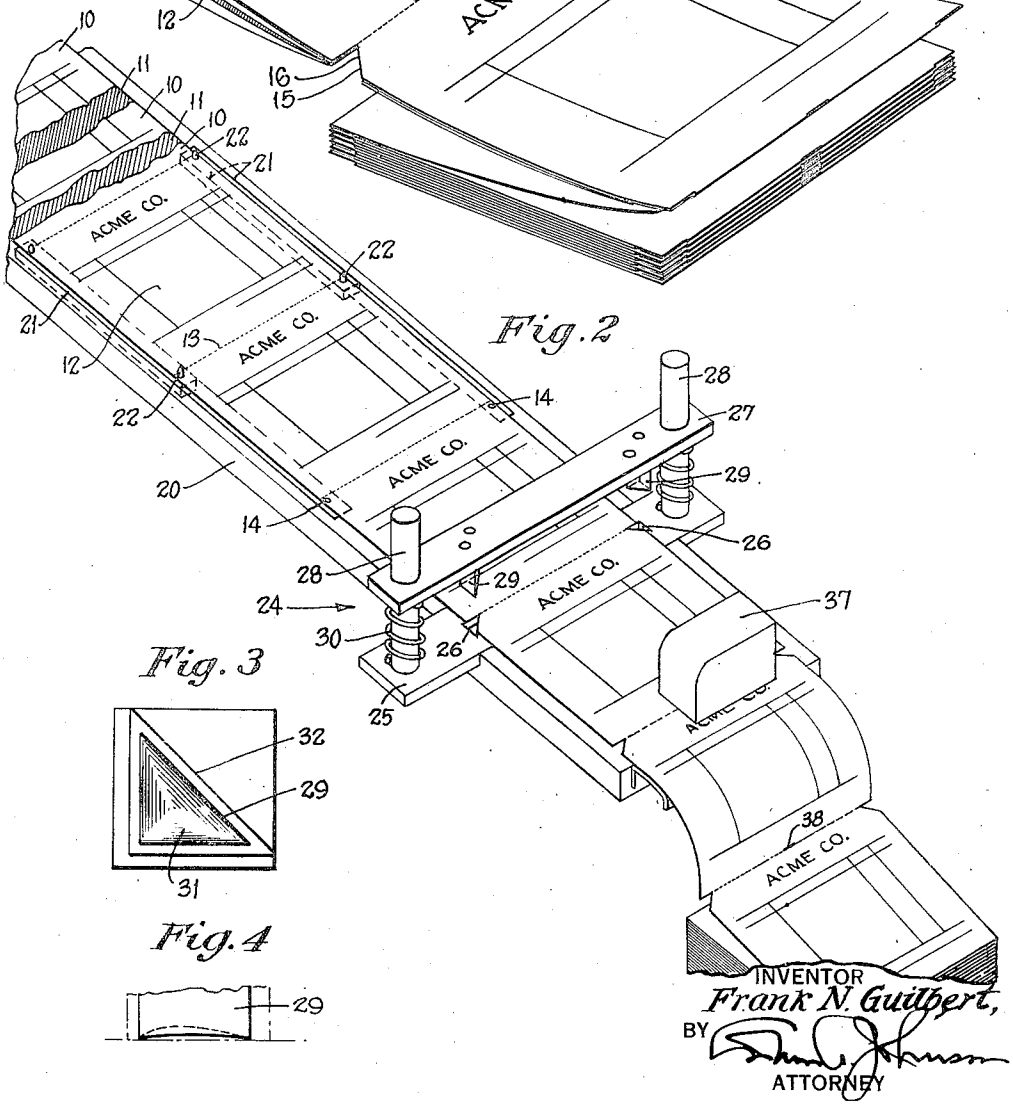


Fig. 3

Fig. 4

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METHOD OF MAKING MANIFOLDING STATIONERY

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19 Claims. (Cl. 270—52)

This invention relates to an improved method of making manifolding stationery for use in typewriters and other manifolding machines, and, more particularly, to the making of stationery having angular notches along the side margins of the strips by means of which the feeding of the strips is arrested when used in a typewriter or other manifolding machine.

In the manufacture of notched-edge stationery, it has been proposed to cut the angular apertures in the paper web at the time the web is being printed. This has been found to be unsatisfactory for several reasons. It was found that, while it was satisfactory and convenient to punch round holes on printing presses of the rotary type, it was difficult to punch clean angular apertures in the web on such a machine due to the arcuate movement of the punch into the die. It was difficult to maintain the punches and dies, used for this purpose and of such irregular shape, sharp. When it came to collating the several strips making up a manifolding pile, it was found difficult to bring these strips into registration without employing substantially the same feed mechanism as is used in the typewriter or manifolding machine, which feed mechanism is comparatively slow in operation. And, it was found that, in slitting the printed webs on the printing press to cut them into strips of desired width, the slitting operation could be performed much more satisfactorily if the portions of the paper engaged by the slitting knives were continuous.

To avoid these difficulties, the present invention provides for printing and slitting the strips on the printing press without producing the angular notches therein at that time. Then, assembling or collating the strips in a separate machine, and, at that time, cutting the angular notches in the sides of the strips making up the pile.

This operation can be performed in the collating machine by any suitable form of reciprocating dies and punches, which, moving perpendicular to the plane of the paper, produce a clean sharp cut. With this arrangement for simultaneously cutting all of the strips of the pile which are to have the notches, it is definitely assured that the notches in the several strips are in register depthwise of the pile.

It is not sufficient, where the notches are to be form-registering as well as feed-arresting, that the notches themselves be in registration, for, due to irregularities in the throw of the press, shrinkage and expansion of the paper, and for other causes known to the art, slight variations exist between the form lengths on the different forms; and, accordingly, the notches should be in register with the printed forms on each strip, and this is the reason for the desire to punch the paper web at the time it is being printed.

To insure that the notches provided in the side edges of the strips are in register with the printing on the strips, the present invention punches in the web pilot or feed holes while the webs are being printed, and these pilot or feed holes are employed to bring the strips into registration in the collating machine before the notches are cut in the strips. In the broader aspects of the invention, the pilot holes may be anywhere in the strips, but, in order that these holes are not left to disfigure the strips, the present invention places the pilot holes in the portion of the web which is to be cut out by the punches and dies to make the angular notches in the side edges of the strips.

Usually, the notches are placed in the strips so that one side of the notch is defined by a line of demarcation between adjacent forms—usually a weakening line—so that the notches are reduced to cut off corners when the forms, of which the strips are composed, are severed along the line of demarcation between them.

After the strips are notched, they may be secured together on the collating machine by a staple, or other wire-stitching device, operated in coordination with the notching device.

When the strips are secured together by a staple, the notches perform the function of arresting the feeding operation, but, when the strips are separate and unsecured, the notches may perform the function not only of arresting the feed but of bringing the strips into registration at each feeding operation of the machine in which they are operated upon.

Other features and advantages will hereinafter appear.

In the accompanying drawing:

Figure 1 shows a perspective view of a pack of cut-corner stationery.

Fig. 2 is a diagrammatic view of the collating, cutting and stapling mechanism.

Fig. 3 shows a bottom plan view of one of the knives.

Fig. 4 shows a side elevation of a portion of the knife.

The present invention relates to the method

of making manifolding stationery of the type shown in Fig. 1, in which a plurality of record strips 10 and transfer strips 11 are interleaved and are provided with angular feed-arresting notches 15 and 16, respectively, at form-length intervals. The record strips are provided with a succession of printed forms 12 thereon which are in registry with the feed-arresting notches. The forms are separated by lines of demarcation —usually lines of weakness 13—extending thereacross at form-length intervals.

In carrying out the present invention, webs for forming the record sheets are fed through a printing press and have record forms 12 printed thereon in succession. At the same time that the forms are being printed on the web, a round pilot hole or registering aperture 14 is punched in each form so as to have a predetermined relation with the printing on the form. Inasmuch as these holes are round, they can be satisfactorily punched in the web while on the press during the printing operation and, therefore, will always be in proper registry with the printing on the web.

The web is then fed through a slitter and severed into record strips of proper width. The slitting of the web can be more satisfactorily performed according to this method since the knives will be operating on a continuous web and will not be engaging spaced openings in the web as heretofore, when the angular feed-arresting notches were cut in the web at the time of printing the same and before the slitting operation.

If desired, the webs can be also provided with the transverse lines of weakness or tear lines 13 to form lines of demarcation between the form lengths at the same time the webs are being printed.

The record strips having a succession of printed forms thereon with each form provided with pilot holes, are then interleaved with the transfer strips having pilot holes at form-length intervals to correspond to the pilot holes on the record strips, and are collated on the collating table 20. The collating table is provided with a pair of reciprocating bars 21 having pins 22 thereon at form-length intervals which are adapted to engage the pilot holes in the record and transfer strips. The pins are of substantially the same diameter as the holes in the strips so that as they pass through the holes in all of the strips they will quickly and accurately register the strips into depthwise alignment. This will position the printing on all of the record strips in the pile in accurate registry.

In addition to registering the strips in depthwise alignment, the pins on the reciprocating bars cooperating with the pilot holes serve to feed the pile of collated strips intermittently along the collating table.

The strips which are now in flat registered relation are ready to have the feed-arresting notches cut therein.

The cutting device 24, provided to cut the marginal notches in the strips, comprises a base 25 provided with a pair of female dies 26 spaced to lie under the edges of the strips and a reciprocating support 27 slidably mounted on posts 28 extending perpendicularly from the base and carrying a pair of male dies or punches 29 positioned to cooperate with the female dies. With this relation existing between the male and female dies, the pile of strips will be cut perpendicular to the surface thereof and a sharp well-defined cut will be made at each cutting operation. The male dies are normally held in raised position by springs 30 surrounding the posts as is usual in the construction of a cutting mechanism of this type and are moved into cooperative relation with the female dies by suitable mechanism (not shown) during the cutting operation.

The strips can be positioned in the cutting mechanism in any desired manner using the pilot holes as the means for positioning the strips therein. In the preferred form of the invention, the cutting device is positioned on the collating table in predetermined relation with the feeding mechanism so that, at the end of the feeding stroke, the forms will be in proper position in the cutting device to have the notches formed therein. The cutting mechanism (through mechanism not shown) operates in timed relation to the feeding of the strips.

When the strips are intermittently fed as in the present preferred form of the invention, the cutting is done while the strips are at rest during the intermission in the feed. Further, the cutting is performed while the registered strips are in flat relation with the punch moving perpendicular to the surface thereof so that the feed-arresting notches will all be in registry depthwise of the pile.

As shown in Figs. 3 and 4, the male die 29 has a recessed face 31 to insure that the cutting edges will always engage the paper first. The male die is provided with the usual spring-pressed wiper collar 32 which prevents the die from lifting the paper as it is withdrawn after cutting through the pile of collated strips. The collar 32 is indicated in Fig. 3, but omitted from Fig. 2 for the sake of clarity.

The angular feed-arresting notches can be positioned at any point along the margins of the forms so long as they are in registry with the printing on the forms. Inasmuch as the strips are positioned in the cutting device by the pilot holes which are formed in absolute registry with the printing, this result will always be attained. Preferably, the notches are formed in the margins so that one side of the notch is defined by the line of demarcation or weakened line between adjacent forms. When the strips are severed along the lines of demarcation into forms, these notches reduce to merely cut-out corners of each form.

In the broader aspects of the invention, the pilot holes can be positioned in any part of the sheet and remain in the sheets after notching. In the preferred form of the invention, however, the pilot holes are punched in the strip in the corners of the forms that are to be cut out and removed by the subsequent notching operation so that these holes will not be left in the form to disfigure it.

As shown in Fig. 2, the pilot holes of an adjacent form will position the form to be cut in the cutting device so that the angular feed-arresting notches will be cut at the upper corners of each form and preferably have one boundary of the notch extending along the line of demarcation between the forms. When this cut is made in the pile of strips, it will not only make the feed-arresting notches in the form but will remove that portion of the record having the pilot hole formed therein. The record forms, which can be severed from the continuous strips, will, therefore, contain only the feed-arresting apertures therein at the corners thereof.

After the feed-arresting apertures have been formed, the pile of strips may or may not be secured together to feed as one. In the preferred form of the invention, a wire stitching mecha-

nism 37 is provided for securing the strips together and is positioned on the collating table at the next step beyond the cutting device to drive a staple 38 through the pile. The device operates on the strips at the same time that the cutting mechanism and in timed relation to the feed thereof.

In the preferred form of the invention, the staple is driven through the pile on the tear line or line of demarcation between the forms and the strips are folded into a zigzag pile along the tear lines.

When the strips are secured together by a staple or other device and fed through a typewriter or the like machine, the notches form feed-arresting apertures and permit the sheets to realign and relieve the strain due to the relative shifting of the sheets in their passage around the curved roller. When the pile is not secured together by a staple or other securing device, the notches 15, 16 in the sheets serve as form-registering apertures as well as feed-arresting apertures. The notches will cooperate with the feed rollers of the usual Shoup & Oliver feed to not only stop the feed but to align the forms depthwise of the pile with the forms in proper registry.

While the preferred form of the invention has been described as being drawn to a collated set of interleaved carbon and record strips, it is to be understood that applicant's invention is not to be limited by this description, it merely being the preferred form of the invention, as applicant is the first to form feed-arresting notches in the strips while in collated relation.

Variations and modifications may be made within the scope of this invention and portions of the improvements may be used without others.

I claim:

1. In the method of making continuous manifolding stationery, the steps of collating a plurality of continuous strips in superposed relation and feeding the collated strips by means of uniformly spaced apertures extending along the length thereof; and cutting through the pile of collated strips to change the feeding apertures into feed-arresting notches therein.

2. In the method of making continuous manifolding stationery, the steps of collating in superposed relation a plurality of continuous strips having pin-engaging apertures at form-length intervals therealong, feeding the collated strips by means of the pin-engaging apertures; and cutting the collated strips to form angular feed-arresting form-registering apertures by removing a portion of the strip containing the pin-engaging apertures.

3. In the method of making continuous manifolding stationery, the steps of collating a plurality of continuous strips in superposed relation; intermittently feeding the collated strips by means of uniformly spaced apertures along the continuous strips; and cutting the collated strips during the period of rest in the intermittent feed to form feed-arresting notches therein.

4. In the method of making continuous manifolding stationery, the steps of collating in superposed relation a plurality of printed continuous strips having positioning apertures at form-length intervals therein in registry with the printing on said strips; registering the strips relative to a cutting device by means of the positioning apertures; and cutting the margins of the pile of registered strips in each form-length thereof to provide feed-arresting notches therein.

5. In the method of making continuous manifolding stationery, the steps of collating and registering a plurality of continuous strips in superposed relation; feeding the collated strips; and cutting through the pile of registered strips to form feed-arresting notches therein.

6. In the method of making continuous manifolding stationery, the steps of collating a plurality of continuous strips in flat superposed relation; registering and feeding the pile of strips in flat condition; and cutting through the pile of collated strips, perpendicularly to the flat surface thereof, to form feed-arresting notches of angular shape therein at predetermined intervals along the continuous strips.

7. In the method of making continuous manifolding stationery, the steps of printing a succession of forms on a continuous strip and at the same time punching a pilot hole in predetermined relation to each of said forms; collating a plurality of printed and punched strips in superposed relation; registering said superposed strips by means of the pilot holes; advancing said registered pile of strips; and cutting said pile of strips to form feed-arresting notches in each form in predetermined relation with the printing on the form.

8. In the method of making continuous manifolding stationery, the steps of printing a succession of forms on a continuous strip and at the same time punching a pilot hole in predetermined relation to each of said forms; collating a plurality of printed and punched strips in superposed relation; registering said superposed strips by means of the pilot holes and advancing said registered pile of strips intermittently form-length extents; and cutting said pile of strips during periods of intermission to form angularly shaped feed-arresting notches therein in predetermined relation to said printed forms.

9. In the method of making continuous manifolding stationery, the steps of printing a succession of forms on a continuous strip and at the same time punching a pilot hole in the strip in predetermined relation to each of said forms; collating a plurality of printed and punched strips in superposed relation; registering said superposed strips by means of the pilot holes; advancing and positioning said registered pile of strips in a cutting means by means of the pilot holes; and cutting said pile of strips in timed relation with the advancing and positioning of the strips to form feed-arresting notches therein in predetermined relation to said printed forms.

10. In the method of making continuous manifolding stationery, the steps of printing a succession of forms on a continuous strip and at the same time punching a pilot hole in predetermined relation to each of said forms; collating the plurality of printed and punched strips in superposed relation; registering said superposed strips by means of the pilot holes; advancing the registered pile of strips intermittently form-lengths extents; positioning a form on the pile of registered strips in a cutting device by means of a pilot hole in an adjacent form; and cutting the pile of strips during periods of intermission to remove that part of the strips in the cutting device having the pilot hole therein so as to change the character of the hole to form feed-arresting notches in predetermined relation to said printed form.

11. In the method of making continuous manifolding stationery, the steps of printing a suc-

cession of forms on a continuous strip and at the same time punching a pilot hole in predetermined relation to each of said forms; collating a plurality of printed and punched strips in flat superposed relation; registering said superposed strips by means of the pilot holes; advancing the flat, registered pile of strips into a predetermined position in a cutting means; and cutting through the pile of collated strips perpendicularly to the flat surface thereof to form feed-arresting notches therein in predetermined relation to the printed forms.

12. In the method of making continuous manifolding stationery, the steps of printing forms on continuous record strips and at the same time punching registering apertures adjacent at least one of the corners of each of the forms; collating the continuous record strips with transfer strips having registering apertures corresponding to the apertures in the record strips in superposed interleaved relation; registering and feeding the collated strips by means of the registering apertures; and cutting the collated pile of strips to remove the transversely aligned corners of each form, including the portions of the strips having the registering apertures therein, to form feed-arresting form-registering notches.

13. In the method of making continuous manifolding stationery, the steps of collating in superposed relation a plurality of continuous strips having transverse lines of weakness at form-length intervals therealong and registering apertures in definite relation to the lines of weakness; registering and intermittently feeding the pile of collated strips by means of the registering apertures; and cutting the collated strips during the period of rest in the intermittent feed to form feed-arresting notches at predetermined positions in each form-length.

14. In the method of making continuous manifolding stationery, the steps of collating in superposed relation a plurality of continuous strips having transverse lines of weakness at form-length intervals therealong and registering apertures in definite relation to the lines of weakness; registering and intermittently feeding the pile of collated strips by means of the registering apertures; cutting the collated strips during the period of rest in the intermittent feed to form feed-arresting notches at predetermined positions in each form-length; and securing the pile together at each line of weakness during the cutting period.

15. In the method of making continuous manifolding stationery, the steps of collating in superposed interleaved relation a plurality of continuous record strips having printed forms thereon and registering apertures in each form in registry with the printing and a plurality of transfer strips having corresponding registering apertures at form-length intervals therein; registering and feeding the collated strips by means of the registering apertures; and cutting the pile of registered strips adjacent the margins to form feed-arresting form-registering notches therein having a side thereof at an angle to the margin.

16. In the method of making continuous manifolding stationery, the steps of feeding a plurality of record strips having transverse lines of weakness spaced therealong at form-length intervals and pin-engaging apertures in the margin of each form adjacent one of the lines of weakness; collating the strips in superposed relation; registering and feeding the collated strips by means of the pin-engaging apertures in the forms; and cutting the margin of each form adjacent the line of weakness to form feed-controlling apertures, and remove the corner of the form including the pin-engaging apertures, with the line of weakness forming one side of the feed-controlling apertures.

17. In the method of making continuous manifolding stationery, the steps of collating in superposed interleaved relation a plurality of continuous record strips having printed forms thereon and registering apertures in predetermined relation to each of said forms and transfer strips having registering apertures corresponding to the apertures in the record strips; registering the interleaved record strips and transfer strips; advancing the registered strips in flat condition by means of the registering apertures; and cutting through the pile of collated strips, perpendicularly to the flat surface thereof, to form angular feed-arresting notches therein having a predetermined relation to the printed forms.

18. In the method of making continuous manifolding stationery, the steps of collating in superposed interleaved relation a plurality of continuous record strips having printed forms thereon separated by transverse lines of demarcation and pilot holes in each form in definite relation to the printed form; a plurality of transfer strips having corresponding apertures at form-length intervals thereon; registering and feeding the pile of collated strips by means of pilot holes; and positioning the registered strips in a cutting device by means of the pilot holes and cutting out at least a pair of transversely aligned corners of each form to form feed-arresting form-registering notches at the corners thereof with the line of demarcation as one boundary of each notch.

19. In the method of making continuous manifolding stationery, the steps of collating in superposed interleaved relation a plurality of continuous record strips having printed forms thereon separated by transverse tear lines and registering apertures in transversely aligned corners of each form adjacent the tear line and a plurality of transfer strips having corresponding apertures at form-length intervals therein; registering and feeding the collated pile of strips by means of the registering apertures; and cutting the margins of the pile of registered strips adjacent the tear line to remove the corners from the forms to form feed-arresting form-registering notches at the corners thereof and remove the registering apertures from the form.

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