Aug. 31, 1943. A. A. JOHNSON 2,328,081

MANIFOLDING STATIONERY

Original Filed Aug. 7, 1941

Fig. 1

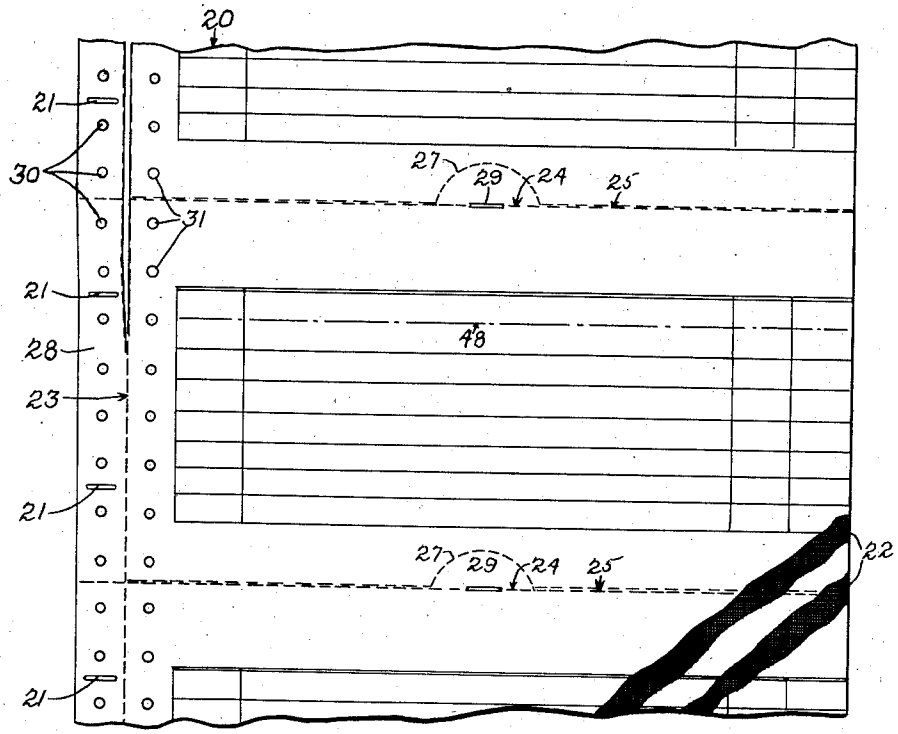



Fig. 4

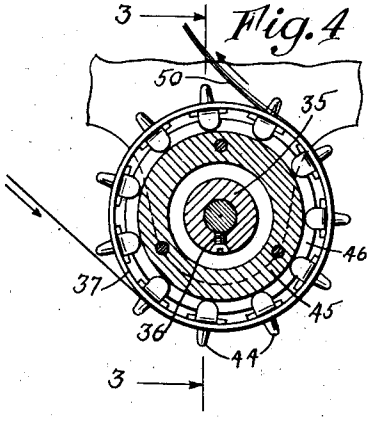



Fig. 3

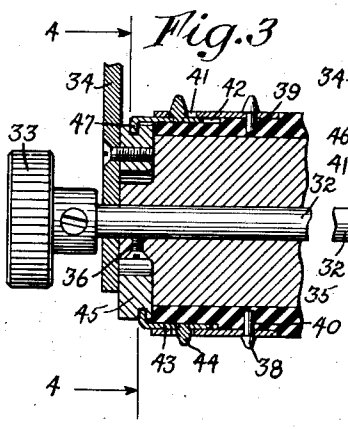
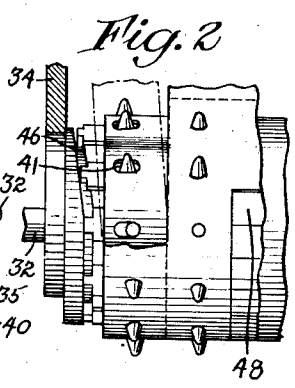
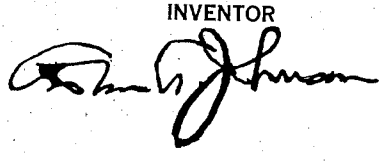



Fig. 2




INVENTOR



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## MANIFOLDING STATIONERY

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10 Claims. (Cl. 282—11.5)

This invention relates to improvements in manifolding stationery, adapted to cooperate with strip-feeding and margin-severing devices, this application being a division of my copending application Serial No. 405,846, filed August 7, 1941.

More particularly, the present invention relates to manifolding stationery having marginal perforations cooperating with movable series of feeding pins to advance the strips while maintaining them in alignment with each other and with the writing line of a writing device, and further being adapted to cooperate with means for automatically severing a binding and feeding margin from the body portions of the strips concurrently with and incident to said feeding operation.

Manifolding stationery, especially for use in typewriters, generally comprises a plurality of superposed continuous strips (usually printed) interleaved with transfer strips, and divided into successive form lengths by transverse weakened severing lines at form-length intervals.

For positive feeding of the record strips, a series of perforations are usually provided adjacent one or both margins for engagement with pin feed devices provided on the writing device, for instance, on the platen of a typewriter.

Depending upon the number and nature of the strips, it is sometimes possible to maintain adequate alignment of the strips by means of a single row of perforations adjacent one margin, which engage a corresponding pin feed device on the platen of the typewriter. However, for many types of stationery, the control and support thus provided is insufficient to maintain the desired alignment of the strips on the platen.

The use of a set of apertures in both lateral margins of the stationery, engaging corresponding dual pin feed devices, is generally more reliable, but requires the use of a platen having a pair of feed-pin members which are spaced apart by a distance determined by the width of the stationery. If stationery of various widths is to be used, the platen must be replaced, or the spacing of the pin feed members must be altered to accord with the width of the stationery.

It is an object of the present invention to provide continuous multiple strip manifolding stationery having a series of pin feed apertures for cooperation with pin feed devices which reliably maintain the strips in accurate registry with the writing line of a writing device, but so arranged that stationery of different widths requires no alteration in the feeding mechanism, and so that one margin is available for inscription.

To accomplish this, the present invention provides the manifolding stationery with at least two transversely spaced series of feeding apertures adjacent a longitudinal margin of the strips, preferably at the left-hand side wherein the individual apertures of one series are preferably aligned, transversely of the strips, with apertures of the other series, and provides a pin feed device with parallel series of pins to engage said apertures. By thus engaging the spaced rows of pins, even though they be at the same side of the platen, the pile of strips being fed is securely held against skewing relative to the platen.

It has been found that stationery which would fail to maintain its alignment if only one set of feeding pins and apertures were used, is satisfactorily aligned by a double set of parallel feed pins and apertures adjacent one of its margins, especially when the apertures and pins are transversely aligned. Since both sets of pins are at the same end of the platen and the use of pins at the other end of the platen is dispensed with, stationery of any width within the limits of the machine may be used without the necessity of altering the machine.

In order to retain the superposed forms and transfer sheets of continuous manifolding stationery against relative mutual shifting during advancement by a feeding device to an inscription position or writing line, the strips and transfer sheets may be fastened together, for instance by staples or adhesive binding along a margin of the strip, and/or by staples at intervals in the body of the strip. To permit separation of the multiple copies after inscription, the bound or stapled margin was formerly removed by hand from the inscribed portion of the strips.

When the superposed manifolding strips, provided with multiple sets of pin feed apertures according to this invention, are bound together at the margin, one set of feed holes is preferably formed in the bound margin and the other set in the body of the strips.

Various means have been proposed heretofore to sever the bound margins of the inscription-receiving portion of manifolding strips. For instance, it has been proposed to use rotary knives or pressure devices which sever or rupture the strip margin incident to the feeding operation.

According to the present invention, the pin feed device is not only adapted to perform the function of positively feeding the strips and maintaining their alignment, but also to sever the bound margin of the strips, incident to its operation.

This is accomplished by so arranging the pin

feed device that as the two series of pins advance or rotate with the platen and progressively engage the series of apertures in the severable bound margin and body of the manifolding stationery, the pins of one set move outward along the platen, diverging from the other set of pins, and apply sufficient lateral tension to the bound margin of the strip to sever it along the weakened severing line from the main portion of the strips.

After the pins have rotated beyond the writing line, the inscribed forms and the severed margin are stripped from the pins for delivery, and the divergently movable severing pins then move back automatically to their initial position where they are adapted to reengage the incoming strips on the receiving side of the platen.

During the severing operation, the strips are subjected to tension solely in transverse direction, whereby the application of any force tending to disalign the body of the stationery at the writing line is avoided.

Since the series of divergent pins and the series of fixed pins are disposed at the same end of a platen advantage may be taken of the other feature of this invention, and no adjustment is necessary to accommodate strips of various widths, accommodated by the length of the platen.

After a form length of stationery issues from the machine and is severed from the strips, its bound margin having been removed in the aforesaid manner, one or more copies thereof may be reinserted in the machine for typing additional data thereon, reengaging the holes with the traveling series of transversely fixed pins, whereby accurate reregistration and realignment of the form with the writing line of the machine is insured.

Other features and advantages of the invention will appear from the following description, referring to the accompanying drawing, in which:

Figure 1 is a plan view of a portion of a strip of manifolding stationery according to the present invention.

Fig. 2 is a view in side elevation of the combined feeding and strip severing device of the present invention mounted on the end of a rotary platen, and including a portion of a manifolding strip engaged therewith.

Fig. 3 is an axial cross-sectional view of the platen and the feeding and severing device of Fig. 2, substantially along the line 3—3 in Fig. 4.

Fig. 4 is a transverse cross-section substantially along the line 4—4 of Fig. 3.

As illustrated in Fig. 1 of the drawing, the stationery, according to the present invention, comprises a plurality of superposed continuous record strips 20 containing printed matter and lines on each form length. Continuous transfer strips 22 are interleaved with the superposed record strips so that the inscriptions on the topmost strip will be reproduced on each of the underlying strips.

Preferably, the strips 20 are divided into form lengths by transverse weakening lines 24 to facilitate separation of the form lengths after inscription.

According to the present invention, a marginal series of apertures 30 adapted to cooperate with the pin feed device is provided adjacent a lateral margin, preferably the left-hand margin 28, of the stationery and a similar series of apertures 31 is provided adjacent the same margin, but spaced inwardly on the strip from the apertures 30. Apertures 30 and 31 are preferably arranged in parallel rows, with the apertures in the two rows in mutual transverse alignment.

Engagement of the two series of apertures with a pair of corresponding pin feed devices on a writing machine maintains the superposed strips accurately aligned with the writing line of the machine, and serves to hold the superposed form lengths in mutual registration. The same pin feed device may be used with strips of varying width without any adjustment or alteration and the margin of the strips opposite the apertured margin is available for inscription.

To prevent relative shifting of the superposed form lengths, the manifolding strips, according to the present invention, are bound together along the margin 28, as for example, by means of staples 21 at longitudinally spaced intervals. Preferably, at least one staple is provided in each form length. A weakening line of perforations 23 is provided in each of the superposed strips between the parallel series of apertures 30 and 31.

After inscription of each form length, the marginal portion 28, bearing staples 21, is severable from the body of strips to permit separation of the superposed copies. By forming the said severing line between the two series of apertures 30 and 31, apertures 30 are removed from the inscribed portion of the form length when the marginal portion 28 thereof is severed. If it is desired to replace one or more copies of the form length in the writing machine for inscription of additional data thereon, the remaining series of apertures 31 may be reengaged with the corresponding pin feed device, whereby the delineations and written matter are accurately realigned in their original relation with the writing line of the machine.

The transfer strips 22 in the manifolding stationery of Fig. 1 are provided with transverse weakening lines 25 which are in registration with the severing lines 24 of the record strips for the major portion of their length, but preferably offset from the severing lines 24 adjacent the center of the strips. As a result, upon severing the written form lengths from the superposed manifolding strips, each of the transfer sheets is left with a tab 27 protruding beyond the transverse severed edge of the record strips 20, while at the same time, a notch is formed in the bottom of each adjacent carbon sheet. The construction illustrated is described in the patent to Conklin No. 2,083,295, issued June 8, 1937.

After removal of the stapled marginal portion 28, the tabs 27 may be grasped with the thumb and forefinger of one hand, while the record sheets are held between the thumb and forefinger at the opposite margin over the notches in the carbon sheets, and the latter may be pulled out as a whole from between the form length record copies.

Moreover, to aid in maintaining the superposed record and transfer sheets of each form length in mutual registration, the superposed strips are preferably secured together by means of staples 29, preferably at the center of the tabs 27 in the carbon sheets, and coincident with the transverse weakening lines 24 of the record strips. Upon severing the superposed strips transversely along the weakened lines 24 and 25, the staple 29 is released from the record strips 20 but still holds the tabs 27 of the transfer strips together,

facilitating removal of all of the transfer strips at the same time.

The transfer strips 22 may extend laterally to the outer margin of the record strips, if desired, so that they are retained in place by the marginal staples 21. If the strips have staples 29 in the center, as shown, these will also serve to retain the transfer sheets against shifting, and the carbon sheets may terminate short of the extreme margin of the record strips, for instance, at the weakened severing line 23.

A feeding device with which manifolding stationery of Fig. 1 is adapted to be used, according to the present invention, is illustrated in Figs. 2 to 4 inclusive, and is shown mounted on the left-hand end of a conventional typewriter platen. The latter comprises a shaft 32 journaled in a stationary bearing plate 34, and carrying a terminal knob 33 for manual rotation thereof, and a platen roll 35 secured thereto by a set screw 36.

The end of the platen roll 35 is reduced to receive a pin ring 37, the outer surface of which is preferably cylindrical and of the same diameter as the platen roll 35. Adjacent its inner end, ring 37 carries a circumferential annular series of radially projecting feed pins 38.

In order to secure the ring 37 to the platen, one or more lugs 39 may be provided thereon which project inwardly from the ring to engage a corresponding socket 40 in the platen. As shown in Fig. 3, the said projections may be formed integral with one or more of the pins 38.

Adjacent its outer end, the ring 37 is provided with an annular series of axially elongated slots 41 which are preferably axially aligned, as illustrated, with the pins 38. The reduced portion of the platen roll 35 is provided with a series of grooves 42 extending axially inward from the end of the roll beneath each of the slots 41.

Each of the grooves 42 is adapted to receive a slide plate 43 carrying a pin 44 which extends through the slot 41 in ring 37. The slide plates 43 are adapted to slide to and fro in axial direction in grooves 42 to move pins 44 back and forth in the slots 41.

The inner ends of the slots 41 are so spaced from pins 38 that when pins 44 are disposed at the inner ends of said slots, the two sets of pins 44 and 38 are adapted to register respectively with apertures 30 and 31 in the manifolding stationery of Fig. 1.

Means is provided, according to this invention, to control movement of the pins 44 in the slots 41 at predetermined points in their travel incident to the rotation of the platen 35. This means comprises a stationary cam plate 45 secured to the bearing plate 34 adjacent the end of the platen roll, said cam plate having a peripheral cam groove 46 for engaging tabs 47 on the outer ends of the slide plates 43.

The manifolding strip is fed to the platen from the rear, passing around the platen from the bottom to the top. At the point where apertures 31 of the stationery first engage pins 38, the cam groove 46 is parallel to a plane perpendicular to the axis of the platen and consequently to the annular series of pins 38, and holds pins 44 inward so that they register with apertures 30 in the separable bound margin strip 28 of the stationery. The engagement of the two sets of pins with the parallel series of apertures insures positive advancement of the strips and holds the superposed record strips and transfer strips in accurate alignment at the writing line of the machine.

As indicated in Fig. 2, cam groove 46 continues parallel to the annular series of pins 38 so as to hold the pins 44 inward at the inner end of the slots 41, substantially until the said pins attain the writing line 48 at the front of the platen. At this point or just beyond, cam groove 46 diverges from the end of the platen. Consequently, as the stationery travels beyond this point, pins 44 move outwardly from pins 38, applying sufficient tension to the strips at the severing line 23 to tear off the bound margin strip 28 containing apertures 30 and staples 21.

The severed margin strips, as well as the record strips leave the feed pins at the top of the platen in the usual manner, any conventional guide or stripper means such as that indicated at 50 being used for this purpose. Beyond this point, cam groove 46 converges inward toward the platen resuming its initial position, parallel to the annular series of pins 38 in advance of the point where the pins first engage the incoming strips of stationery. As a result, pins 44 are progressively returned to their inward positions in slots 41, whereby they are again adapted, with pins 38, to engage the apertures 30 and 31 in the incoming stationery on the receiving side of the platen. During the severing operation, pins 38 retain the inscribed portion of the strips in accurate alignment by continued engagement with the perforations 31 until the strips leave the platen on its delivery side.

As the inscribed forms issue from the machine, they may be severed at will along transverse severing lines 24 and 25. The transfer sheets 22 are removed as a unit from the record sheets 20 by grasping the tabs 27 at one end of the form length and the record sheets at the corresponding notch at the opposite margin, and pulling the two apart. The transfer sheets, which are held together by the central staples 29 are snapped out as a unit, leaving the inscribed forms ready for distribution.

As stated above, certain of the inscribed record sheets may be reinserted into the machine in such a manner that apertures 31 reengage pins 38. Additional data may then be inscribed on the forms, the said pins insuring proper realignment of the printed forms with the writing line of the machine.

By virtue of the fact that both sets of pins are disposed at the same end of the platen, the stationery may be made of any desired width which can be accommodated by the length of the platen without any change in the feeding and severing mechanism.

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. A strip of continuous stationery having a longitudinal weakened severing line adjacent one margin thereof; a longitudinal series of spaced apertures between said severing line and the margin adapted to engage a pin feeding mechanism; and means adjacent said severing line in the main portion of the strip for engaging positive strip-holding strip-aligning means.

2. A strip of continuous stationery having a longitudinal weakened severing line adjacent the margin thereof; a longitudinal series of spaced apertures between said severing line and the margin adapted to engage a pin feeding mechanism; and a second series of spaced apertures

adjacent said severing line in the main portion of the strip for engaging positive strip-holding strip-aligning means.

3. A manifolding strip having a longitudinal severing line adjacent one margin thereof, and at least two laterally spaced longitudinal series of physical alterations for engaging positive strip-advancing and strip-aligning means, said severing line being located between two of said series of physical alterations.

4. Manifolding stationery comprising a plurality of continuous superposed record and transfer strips having at least two laterally spaced longitudinal series of pin-engaging apertures adjacent one longitudinal margin of a pile of strips and a longitudinal severing line between two of said series of pin-engaging apertures.

5. Manifolding stationery comprising a plurality of continuous superposed strips having transfer means interposed therebetween; a longitudinal severing line adjacent one margin thereof; means securing the superposed strips together along said margin, said strips having a longitudinal series of apertures adapted to engage positive strip-advancing means in the severable margin of the strips and a similar series of apertures on the other side of said severing line and adjacent thereto.

6. Manifolding stationery comprising a plurality of continuous superposed strips having transfer means interposed therebetween; a longitudinal severing line adjacent one margin thereof; means securing the superposed strips together along said margin, said strips having a longitudinal series of apertures adapted to engage positive strip-advancing means in the severable margin of the strips and a similar series of apertures on the other side of said severing line and adjacent thereto, adjacent apertures in the respective series being transversely aligned of the strip.

7. Manifolding stationery comprising a plurality of continuous superposed strips having transfer means interposed therebetween, said strips being divided into successive form lengths by transverse weakened severing lines and having a longitudinal severing line adjacent one margin thereof, said strip having a longitudinal series of apertures in the severable margin of the strip adapted to engage positive strip-advancing means, and a similar series of apertures on the other side of said severing line and adjacent thereto.

8. Manifolding stationery comprising a plurality of continuous superposed strips having transfer means interposed therebetween; a longitudinal severing line adjacent the left-hand margin thereof, means securing the superposed strips together along said margin, said strip having a longitudinal series of apertures in the severable margin of the strip, adapted to engage positive strip-advancing means; and means within the body of the strips adjacent said severing line, for engaging positive strip-holding strip-aligning means.

9. Manifolding stationery comprising a pile of continuous record strips having transfer means interposed between them and adapted to be fed by feeding pins engaging one only of the longitudinal margins of the pile of strips, said strips having at said longitudinal margin two adjacent rows of pin-engaging strip-controlling apertures, the apertures of the respective rows being in mutual alignment transversely of the strips for simultaneous engagement with a plurality of aligned feeding pins whereby the strips are supported against skewing transversely.

10. Manifolding stationery comprising a pile of continuous record strips having transfer means interposed between them; and means binding the superposed strips together along one longitudinal margin of the strips, said strips being adapted to be fed by feeding pins engaging one only of the longitudinal margins of the pile of strips, said strips having at said binding margin two adjacent rows of pin-engaging strip-controlling apertures, the apertures of the respective rows being in mutual alignment transversely of the strip for simultaneous engagement with a plurality of aligned feeding pins whereby the portions of the strips from said binding margin to the unbound margin are supported against skewing transversely.

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