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A. A. JOHNSON

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MANIFOLDING

Filed March 12, 1932

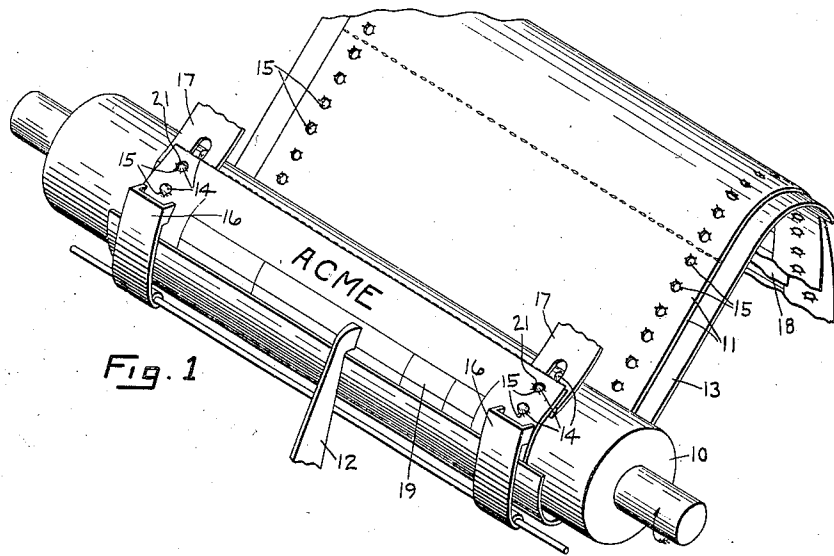


Fig. 1

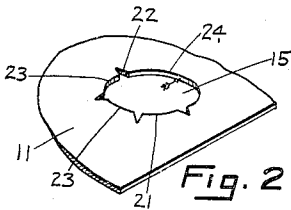


Fig. 2

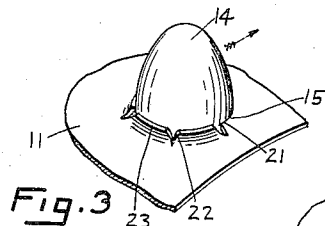


Fig. 3

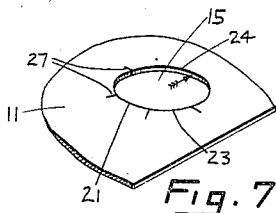


Fig. 4

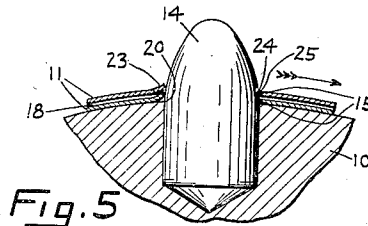


Fig. 5

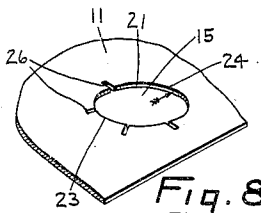


Fig. 6

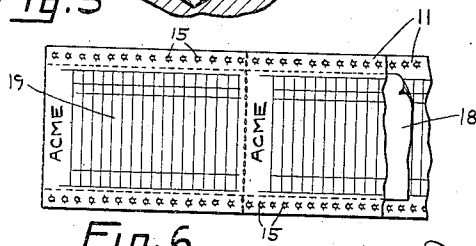


Fig. 7

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UNITED STATES PATENT OFFICE

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MANIFOLDING

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This invention relates to feeding a plurality of record strips in manifolding machines such as typewriters, and more particularly, to positive feeding means and the paper strips used therewith.

In manifolding registers and typewriters, it has heretofore been proposed to feed continuous strips by means of pins arranged around the circumference of a wheel or the platen and disposed radially so as to cooperate with a plurality of superposed strips having one or more longitudinally extending rows of apertures to engage the pins.

It is, of course, desirable to have the pins of a single feeding device made uniform in diameter, but this requires close manufacture with very little tolerance.

It is also desirable to have all the pin-wheel devices made by a manufacturer with the pins of the same standard dimension, but this is more difficult to control, since, in making the pins, the tools wear from time to time.

Also, in manufacturing the paper, it is extremely difficult to maintain within the extremely small limits the dimensions of the feeding holes or apertures from time to time, and this is more especially so when the paper supplied to the machine is made by different manufacturers.

Accordingly, it has been the practice heretofore, to make the holes in the paper slightly larger than the base of the pins to increase the tolerance which is permitted in the manufacture of the pins and the punching of the paper.

When this is done and a large hole at one extreme of the tolerance and a small pin at the other extreme of the tolerance happens to cooperate, the driving connection between the pin and the hole is greater than desired, resulting in a loose connection which might cause lack of accurate registration between the platen and the paper strips, or between several of the paper strips themselves.

To avoid these difficulties and yet permit convenient tolerance to be set on the manufacture of the pins and the punching of the paper, the present invention provides means whereby the feeding apertures in the paper

accommodate or adjust themselves to the particular pin with which they happen to engage. This is accomplished by making the dimensions of the apertures exactly equal to the dimensions of the base of the pins, or less than the latter, and providing the margin of the holes with physical alterations which render them flexible and permit them to be pressed upwardly around the portion of the pin which they happen to engage.

This is accomplished without making the driving connection between the pin and the paper any less positive than it was with the ordinary pin or hole by leaving the leading edges of the pinwheel apertures unaltered and providing the alterations in the two-thirds part of the circumference of the hole which is opposite the leading edge thereof.

By these means, the present invention not only assures successful and proper driving connection between a single strip and the pin-wheel feeding device, but also assures that the several strips making up the superposed pile which is advanced by the feeding device firmly engages the pin regardless of its distance from the base of the pin, and even though, as is preferred, the pins are tapered from their base to a pointed end. With the self-adjusting aperture of the present invention, the dimensions of the aperture are initially so made that they will snugly fit the tapered portion of the pin which they would engage even if they were the uppermost of a plurality of strips.

Hence, with the arrangement of the present invention, the uppermost strips are not loosely held by the pins as a result of engaging a portion thereof of less circumference than the base portion.

The physical alterations which render the margins of the apertures flexible may be in the form of slits cut therein, or they may be in the form of slots or V-shaped notches—their exact form being immaterial so long as they render the margin of the hole flexible so that the hole may accommodate itself to the portion of the pin which it happens to engage.

Other features and advantages will hereinafter appear.

In the accompanying drawing—

Figure 1 is a perspective view of a typewriter platen, showing a plurality of superposed continuous strips supported thereby and showing the pinwheel feeding device engaged with apertures in the paper.

Fig. 2 is a fragmentary view of a portion of the paper strip on an enlarged scale, showing the form of the invention wherein the margin of the aperture is made flexible by providing V-shaped notches therein.

Fig. 3 is a perspective view, showing the fragment of the paper shown in Fig. 2 applied to a pin.

Fig. 4 is a top plan view of the part shown in Fig. 3.

Fig. 5 is a sectional view of a fragment of the platen or pinwheel, showing the pin elevation and a plurality of paper strips having their apertures adjusted to the pin.

Fig. 6 is a plan view of a superposed pile of record strips between which there is located a carbon or transfer strip.

Fig. 7 is a view like Fig. 2, but showing slits constituting the physical alterations of the margin of the aperture in the paper strip.

Fig. 8 is a view like Fig. 7, but showing a form where slots constitute the physical alterations.

The present invention may be employed in manifold registers, or in typewriters. As shown, it is applied to a typewriter platen around which superposed record strips 11 are to be advanced past a printing point where type bars 12 strike the paper strips, the paper being guided by a table 13. The platen carries pins 14 which engage apertures 15 in the side margins of the record strips 11, the paper being held on the pins at the writing line by guides 16 and being stripped therefrom after passing the printing point by strippers 17. To facilitate entrance of the pins 14 into the apertures 15 as the paper is advanced, the pins 14 are preferably tapered. Between the record strips 11 there is provided a transfer or carbon strip 18.

The record strips 11 are usually provided with printing 19, and it is the purpose of the pins 14 and apertures 15 to maintain registration of the printing 19 on the upper and lower strips 11 as they are advanced by rotation of the platen and also to maintain the printing in strict coordination and alignment with the line of writing.

As stated above, to avoid the difficulties heretofore referred to, the apertures 15 were made somewhat larger than the pins to allow sufficient tolerance in the manufacture of the pins and the punching of the paper.

According to the present invention, however, this is not done. Instead, the pins 14 and apertures 15 are so made that the base 20 of the pin—namely, that portion which is located at the circumference of the platen or wheel carrying the pins—is larger than the

circumference of the aperture 15. If this alone were done, the pin would hold the paper from close engagement with the platen, or, if sufficient pressure were applied, it would cause the paper to be torn at the weakest points in its circumference, and being uncontrolled or unregulated the tearing might damage the margin of the aperture to such an extent that the paper would not feed at all.

This is avoided by the present invention by providing the margins 21 of the apertures with physical alterations whereby the margins are made flexible so as to be bent up around the surface of the large pin more or less, according to the portion of the pin which happens to be engaged, thus accommodating or adjusting themselves to the pins.

In the form of the invention shown in Figs. 2 to 5, this is done by providing notches 22 in the margins 21 of the apertures and thereby leaving portions 23 between the notches which may be flexed upwardly around the surface of the pin as shown in Figs. 3, 4 and 5, and this flexing will be more or less, depending upon the particular pin and the portion of the pin which the apertures happen to engage. For instance, as shown in Fig. 5, the lower strip 11, engaging as it does the base 20 of the pin, flexes upwardly more than the upper strip 11 which engages a reduced portion of the tapering pin. Accordingly, both strips 11 are firmly in engagement with the pin 14 and this would be true even to the uppermost of the large number of strips which might be written upon on the platen.

The notching of the margin 21 of the aperture 15, according to the present invention, is omitted at the leading edge 24 of the aperture, thus presenting to the advanced edge 25 of the pin (see Fig. 5) an unraised and predetermined and definite portion of the paper. The extent to which the notching 22 may approach the leading edge 24 of the aperture depends a great deal upon the strength and stiffness of the paper employed, and it has been found that when the notching is confined to that two-thirds of the margin 21 of the aperture which is opposite the leading edge 24, good results are obtained. With some qualities of paper, the notching can be continued all around the margin 21.

Instead of making the margin 21 of the aperture flexible by notching, as with the notches 22 in Fig. 2, it may be accomplished by slots 26 as in the form shown in Fig. 8, or by plain slits 27 which may be cut clear through, or which may only partially weaken the margin—it being sufficient, for the purpose of this invention, that the margin 21 of the aperture be so prepared that unregulated tearing of the paper by the pins be avoided.

As shown, the upper strips 11 are provided with marginal apertures 15 at both side

edges. This is not essential, as it has been found that under some circumstances a single row of apertures and a single pinwheel is sufficient.

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

Having thus described the invention, what is claimed as new and for which it is desired to obtain Letters-Patent, is:—

1. A manifolding strip having a longitudinal succession of pin-engaging apertures, the margin of each aperture having physical alterations leaving it flexible and self-adjustable to the portion of the pin engaging the same.

2. In combination, a tapering pin, and a manifolding strip having a longitudinal succession of pin-engaging apertures, the apertures having a circumference less than the circumference of the base of the pin, the margin of each aperture having physical alterations leaving it flexible and self-adjustable to the portion of the pin engaging the same.

3. A manifolding strip having a longitudinal succession of pin-engaging apertures, the margin of each aperture having weakening portions leaving it flexible and self-adjustable to the portion of the pin engaging the same.

4. In combination, a tapering pin, and a manifolding strip having a longitudinal succession of pin-engaging apertures, the apertures having a circumference less than the circumference of the base of the pin, the margin of each aperture having weakening portions leaving it flexible and self-adjustable to the portion of the pin engaging the same.

5. A manifolding strip having a longitudinal succession of pin-engaging apertures, the margin of each aperture having physical alterations leaving it flexible and self-adjustable to the portion of the pin engaging the same, and the physical alterations being located behind the leading edge of the aperture.

6. A manifolding strip having a longitudinal succession of pin-engaging apertures, the margin of each aperture having weakening portions leaving it flexible and self-adjustable to the portion of the pin engaging the same, and the leading edges of the apertures being devoid of weakening portions and therefore unweakened.

7. A manifolding strip having a longitudinal succession of pin-engaging apertures, the margin of each aperture having short radial slits leaving it flexible and self-adjustable to the portion of the pin engaging the same.

8. A manifolding strip having a longitudinal succession of pin-engaging apertures, the margin of each aperture having short radial slots leaving it flexible and self-adjust-

able to the portion of the pin engaging the same.

9. A manifolding strip having a longitudinal succession of pin-engaging apertures, the margin of each aperture having V-shaped notches leaving it flexible and self-adjustable to the portion of the pin engaging the same.

10. A manifolding strip having a longitudinal succession of pin-engaging apertures, the margin of each aperture having weakening portions leaving it flexible and self-adjustable to the portion of the pin engaging the same, and the weakening portions being confined to less than the two-thirds of the circumference of the aperture which is opposite the leading edge of the aperture.

11. In combination, feeding means comprising a rotatable member having around its circumference radially disposed tapered pins, and a record strip having a longitudinally disposed row of apertures to be engaged by said pins in feeding the strips, said apertures being in circumference smaller than the circumference of the base of the pins, the margin of each aperture having physical alterations rendering it flexible and the aperture self-adjustable to the base of the pin which happens to enter the aperture.

12. In combination, feeding means comprising a rotatable member having around its circumference radially disposed tapered pins, and a plurality of superposed record strips each having a longitudinally disposed row of apertures to be engaged by said pins in feeding the strips, said apertures being in circumference smaller than the circumference of the base of the pins, the margin of each aperture having physical alterations rendering it flexible and the aperture self-adjustable to the portion of the tapered pin which engages each strip.

13. In combination, feeding means comprising a rotatable member having around its circumference radially disposed tapered pins, and a plurality of superposed record strips each having longitudinally disposed rows of apertures to be engaged by the pins in feeding the strips, said apertures being in circumference smaller than the circumference of the base of the pins and the margin of each aperture having physical alterations rendering it self adjustable to the portion of the pin which it engages.

14. A worksheet having a pin-engaging aperture therein, the margin of the aperture having physical alterations rendering it flexible and self-adjustable to the portion of the pin engaging the same.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 11 day of March, 1932.

ARTHUR A. JOHNSON.