June 15, 1943. D E. KRESSLER 2,322,030

MANIFOLDING MEANS

Filed May 11, 1942

Fig.1.

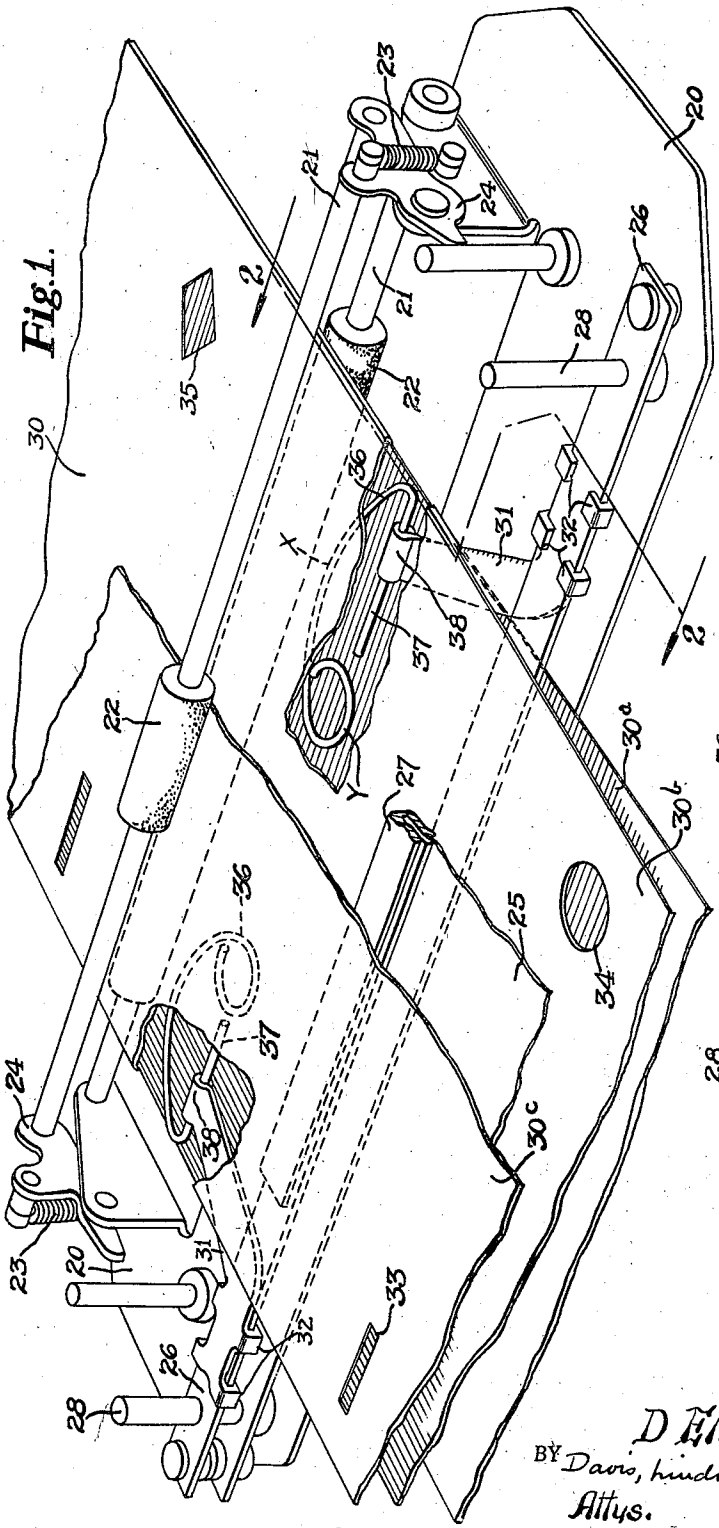
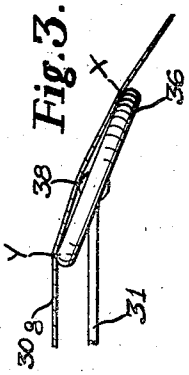


Fig.3.



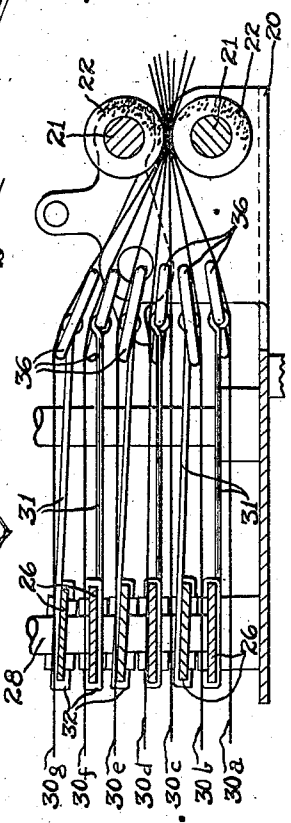


Fig.2.

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MANIFOLDING MEANS

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6 Claims. (Cl. 164—39)

This invention relates to improvements in manifolding means for printing business machines of the kind adapted for the use of a plurality of superposed continuous paper webs formed by longitudinal folding of a continuous paper strip of sufficient width to provide the required plurality of superposed webs. In such manifolding equipment, the several webs frequently are slit apart along the longitudinal folds, before they reach the printing mechanism, by means of slitter blades mounted adjacent the path of the paper webs and entering between adjacent webs across the fold lines at which adjacent webs are connected at their adjacent lateral edges. Some or all of the webs may have perforations at spaced intervals adjacent their lateral edges, such that the ends of the slitter blades may occasionally catch in the perforations and cause tearing and spoilage of sections of the paper web. As the superposed webs provide successive sets of registering forms, the tearing and spoilage of a section of one web necessitates discard of a section of each of the other webs, so that the waste of paper is quite considerable in addition to the loss of time and effort of the operator.

An object of the present invention is to provide, in a manifolding means of the kind mentioned, a guide means in conjunction with the slitter blade to prevent the end of the slitter blade from engaging in the perforations of the paper webs and damaging them or causing loss of time and effort of the operator.

The perforations formed in the edges of the paper webs supplied for various purposes and by various manufacturers vary considerably in size, form and location. A further object of the invention is to provide a guide means of the kind referred to above which will be efficacious when used with continuous paper webs having perforations of various forms, sizes and locations.

In manifolding means of the kind referred to above the superposed paper webs, particularly the outermost webs of a set, may be bent at a considerable angle over the edge of the blade or guide extending between them, particularly as the superposed webs pass through a pair or pairs of guides or pressure rollers before reaching the slitter blades and are again pressed together before reaching the printing mechanism. A further object of the invention is to provide, in conjunction with a slitter blade, a guide means which will decrease the acuteness of the bending of the paper webs where they pass the ends of the slitter blades.

A further object of the invention is to provide, in conjunction with a slitter blade, an efficacious guide means which is simple and inexpensive to manufacture and requires in its production the use of only a minimum amount of metal.

Further objects and advantages of the invention will become apparent from the following description.

One embodiment of the invention is illustrated, by way of example, in the accompanying drawing, in which—

Figure 1 is a perspective view of a movable carbon carrier frame of a manifolding means for use with typewriters, and to which the invention has been applied;

Fig. 2 is a vertical section on the line 2—2 of Fig. 1 looking in the direction of the arrows; and

Fig. 3 is a right-hand side view of a portion of a slitter blade provided with the guide means of the present invention, and illustrating the manner of cooperation of the guide means with a paper web.

In the drawing, the invention has been illustrated, by way of example, as applied to the manifolding means of the Butler Patent No. 2,136,671. As in the Butler patent, the manifolding means comprises a carbon carrier frame supported rearwardly of the paper carriage (not shown) of a typewriter or other printing business machine for movement toward and from said paper carriage on a track frame (not shown) attached to said paper carriage. The carbon carrier frame comprises a supporting plate 20 supporting a pair of shafts 21 on which are mounted pressure rolls 22 yieldingly pressed toward each other by springs 23 connected between the carrier plate 20 and arms 24 carrying one of said shafts and pivoted on the plate 20. The blades 26, to which carbon sheets 25 are adapted to be attached by means of clips 27, are apertured to permit said blades to be stacked on upstanding studs 28, secured in the carrier plate 20, after said blades and the attached carbon sheets have been placed between successive webs 30*a*, 30*b*, 30*c*, etc., of a set of superposed paper webs passing forwardly between the pressure rolls 22 from a supply (not shown) located at the rear of the machine.

When the set of superposed paper webs 30 is formed by longitudinal folding of a strip having an original width equal to the combined widths of the superposed webs and carbon supporting blades 26 of the kind shown in the drawing are employed, it is necessary to slit the webs apart along their connected lateral edges prior to the time that they reach the carbon supporting

blades in their forward travel. For this purpose, each carbon supporting blade 26, formed preferably of relatively thin, flat steel strip, has adjustably mounted thereon a slitter blade 31 which is formed preferably of thin, flat steel preferably of a thickness less than the thickness of the blade 26, and which is attached to the carbon supporting blade 26 for adjustment lengthwise of said blade 26, by having four lateral lugs 32 on the supported end of the slitter blade 31 bent around the carbon supporting blade 26. From the portion supported on the carbon blade 26, the slitter blade 31 is inclined rearwardly and inwardly toward the path of the paper webs and has its free end inserted between two paper webs inwardly of their lateral edges, which are connected together along the line of folding so that, upon relative movement between the carbon carrier frame 20 and the superposed paper webs as the necessary records or data are printed on the successive sets of forms on the paper webs, the inclined slitting edges of the slitter blades 31 will separate the connected edges of the superposed webs just rearwardly of the carbon supporting blades 26.

As the webs of each adjacent pair of superposed webs, such as 30*a* and 30*b*, 30*b* and 30*c*, etc., are connected together at alternate sides of the set of webs, the slitter blades 31 on successive ones of the carbon blades 26 mounted on the studs must be located at alternate sides of the path of the paper webs. However, the carbon supporting blade and slitter blade assemblies are all identical and the slitter blade 31 may be located at either margin of the set of webs by merely turning the carbon blade 26 over end for end.

One or more of the paper webs of each set 30 of superposed paper webs may be perforated along one lateral margin or the other to permit one or more of the forms of each set of forms printed in the machine to be bound in loose-leaf binders. The perforations on different sets of webs may be of various shapes and sizes and formed at various positions on the paper webs as indicated for purpose of illustration at 33, 34 and 35 in Fig. 1, though it will be understood that usually only one form of perforation will be used in one set of webs. It, therefore, frequently happens that, during relative movement between the paper webs and the slitter blades 31 as successive sets of forms are printed in the machine, the slitter blades may engage in the perforations in the paper webs and damage or spoil sets of forms, thus causing waste of material and loss of time and effort of the operator. To eliminate that difficulty, guide members 36 are pivotally mounted on the free ends of the slitter blades 31 located between the paper webs.

The guide member 36 is preferably formed of a length of preferably steel wire bent substantially as shown in Fig. 1 to provide a straight shank portion 37 which is received in the cylindrically bent free end 38 of the slitter blade to permit the guide member 36 to pivot freely on the end of the slitter blade 31 along an axis transverse to the travel of the paper webs. From this shank portion 37, the wire forming the guide member is curved rearwardly and then laterally inwardly toward the center of the paper web and has its other end bent into a substantially closed loop which approaches relatively closely to the end of the shank portion 37 so that the wire forms two substantially closed loops somewhat similar to a script "J" or "I" with portions to support a paper web on opposite sides of the pivotal axis of the guide. The bending of the wire is preferably such that all portions of the guide member 36 lie in substantially a single plane, as shown in Fig. 2.

The straight shank portion 37 of the guide member received in the cylindrically bent end 38 of the slitter blade permits the guide member 36 not only to pivot freely, as already stated, but also permits adjustment of the guide member relative to the slitter blade 31 transversely of the direction of travel of the paper webs.

The guide member 36 not only prevents the edges of the perforwations 33, 34 and 35 in the paper webs from catching on the slitter blade 31 or guide member 36 and thus becoming damaged, but also substantially eliminates another cause of occasional damage and spoilage of paper in that it reduces the acuteness of the bending of the paper web where it passes over the end of the slitter blade, particularly in the case of the uppermost and lowermost blades 31 when four or more carbon supporting blades and slitter blades are required to be stacked on the studs 28 where five or more superposed paper webs are being used. The paper webs are caused to diverge vertically as they reach the ends of the slitter blades 31 in their passage forwardly from between the pressure rolls 22 and then continue forwardly substantially parallel to each other until they have passed the carbon blades 26. The necessity for keeping the dimensions at a minimum requires that the pressure rolls 22 be relatively close to the ends of the slitter blades 31. Instead of permitting the direction of the outermost sheets from changing considerably as they pass over the ends of the outermost slitter blades 31, the guide members 36 mounted in the ends of said slitter blades cause the change of direction of the sheets to be effected at a plurality of separated points so that the change of direction of the sheets at each of these points is only a fraction of that which would otherwise occur as the sheets pass over the ends of the slitter blades. As shown in Fig. 3 the bending of the sheet 30*g* will occur substantially at points *x* and *y* where the sheet first encounters and where the sheet leaves the guide member 36, as well as where the sheet contacts the cylindrically bent end portion 38 of the slitter blade, so that the change of direction of the sheet is effected in stages at three spaced points in the vicinity of the end of the slitter blade and is not sharply bent at any of these points. Also, the guide 36 supports a portion of the paper web having considerable area and so minimizes the possibility of the end of the slitter blade breaking through the paper web outside of the area of a perforation under any likely circumstances.

It will also be apparent from the foregoing that the construction is simple and inexpensive to produce and secures the objects of the invention with a great economy of metal.

While the exact form of the invention above described and shown in the accompanying drawing is admirably suited to achieve the objects of the invention, it will be apparent that the invention may also be embodied in other forms within the scope of the appended claims.

I claim:

1. In a manifolding means adapted for use with a plurality of superposed continuous paper webs formed by longitudinal folding of a con-

tinuous paper strip, the combination of a slitter blade supported laterally adjacent the path of said webs and entering between adjacent webs across their longitudinal edges where they are joined along a longitudinal fold of said strip to effect slitting along said fold by relative movement between said webs and blade longitudinally of said webs, and a guide member pivoted on the end portion of said slitter blade located between said adjacent webs and extending from said slitter blade end portion a substantial distance transversely of the length of said webs.

2. In a manifolding means adapted for use with a plurality of superposed continuous paper webs formed by longitudinal folding of a continuous paper strip, the combination of a slitter blade supported laterally adjacent the path of said webs and entering between adjacent webs across their longitudinal edges where they are joined along a longitudinal fold of said strip to effect slitting along said fold by relative movement between said webs and blade longitudinally of said webs, and a guide member pivoted on the end of said slitter blade between said adjacent webs on an axis transverse to the length of said webs and extending in both directions longitudinally of said webs from said slitter blade end.

3. In a manifolding means adapted for use with a plurality of superposed continuous paper webs formed by longitudinal folding of a continuous paper strip, the combination of a slitter blade supported laterally adjacent the path of said webs and entering between adajcent webs across their longitudinal edges where they are joined along a longitudinal fold of said strip to effect slitting along said fold by relative movement between said webs and blade longitudinally of said webs, and a guide member pivoted on the end of said slitter blade between said adjacent webs on an axis transverse to the length of said webs and extending in both directions longitudinally of said webs from said slitter blade end and a substantial distance transversely of the length of said webs.

4. In a manifolding means adapted for use with a plurality of superposed continuous paper webs formed by longitudinal folding of a continuous paper strip, the combination of a slitter blade supported laterally adjacent the path of said webs and entering between adjacent webs across their longitudinal edges where they are joined along a longitudinal fold of said strip to effect slitting along said fold by relative movement between said webs and blade longitudinally of said webs, and a guide member formed of a length of wire bent to form a shank pivotally supported in the end of said slitter blade located between said adjacent webs and loop portions to engage a paper web at a substantial distance transversely of the length of said webs and at distances in both directions longitudinally of said webs from said slitter blade end.

5. In a manifolding means adapted for use with a plurality of superposed continuous paper webs formed by longitudinal folding of a continuous paper strip, the combination of a slitter blade supported laterally adjacent the path of said webs and entering between adjacent webs across their longitudinal edges where they are joined along a longitudinal fold of said strip to effect slitting along said fold by relative movement between said webs and blade longitudinally of said webs, and a guide member formed of a length of wire bent to form a shank pivotally supported in the end of said slitter blade located between said adjacent webs and loop portions to engage a paper web at a substantial distance transversely of the length of said webs and at distances in both directions longitudinally of said webs from said slitter blade end, said shank and loop portions of said guide being positioned in a single plane.

6. In a structure of the class specified, the combination of a supporting member across which a web folded longitudinally into a plurality of superposed plies passes, a slitter blade on said supporting member and entering between plies of said web at an inclination across the fold at which their longitudinal edges join, and a guide member pivoted on the end of said slitter blade between said web plies on an axis transverse to the relative travel between said blade and web and having portions to bear on said web at both sides of said pivoted axis.

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