

May 22, 1928.

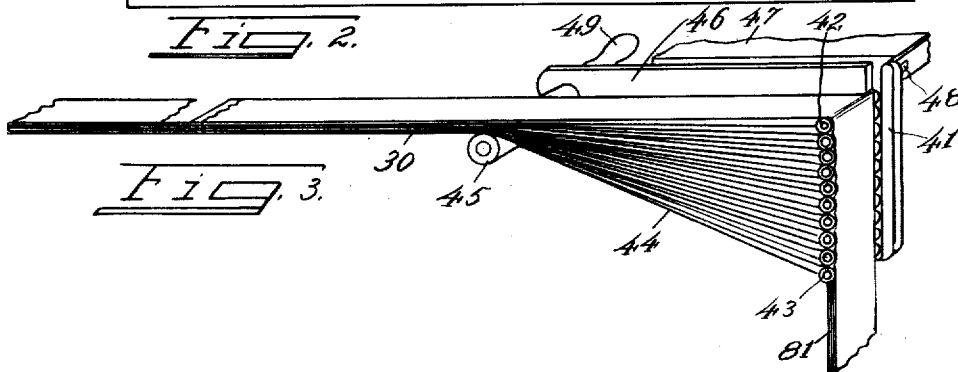
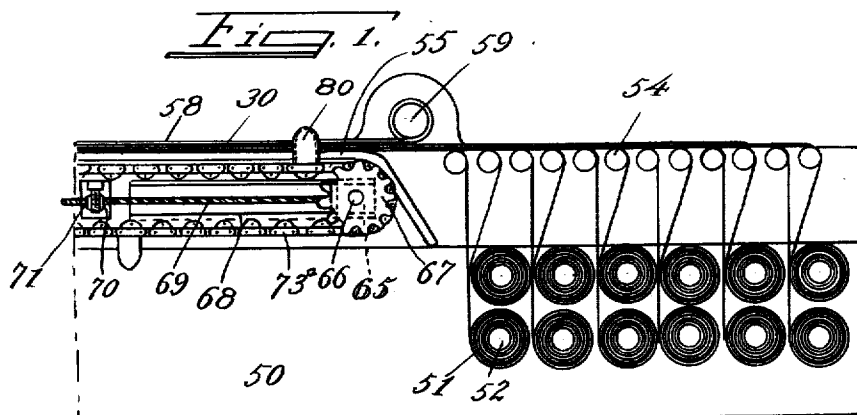
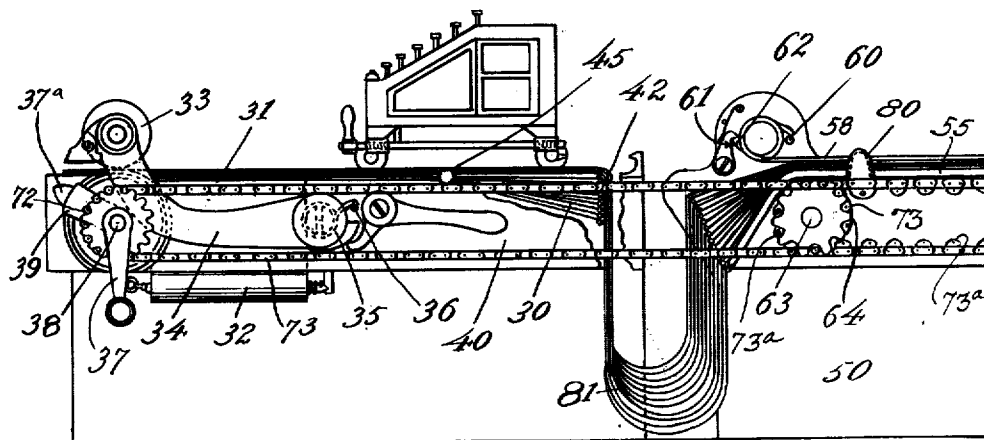
1,670,787

J. Q. SHERMAN ET AL

FLAT BED MANIFOLDING MACHINE

Original Filed Dec. 29, 1920

2 Sheets-Sheet 1



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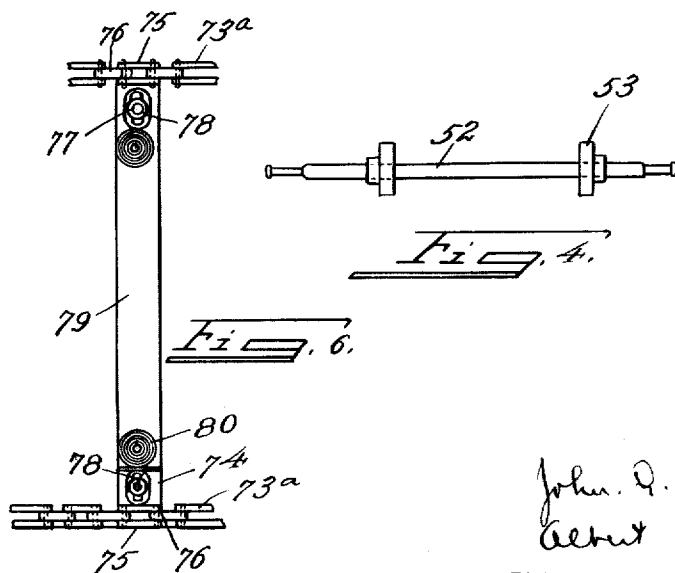
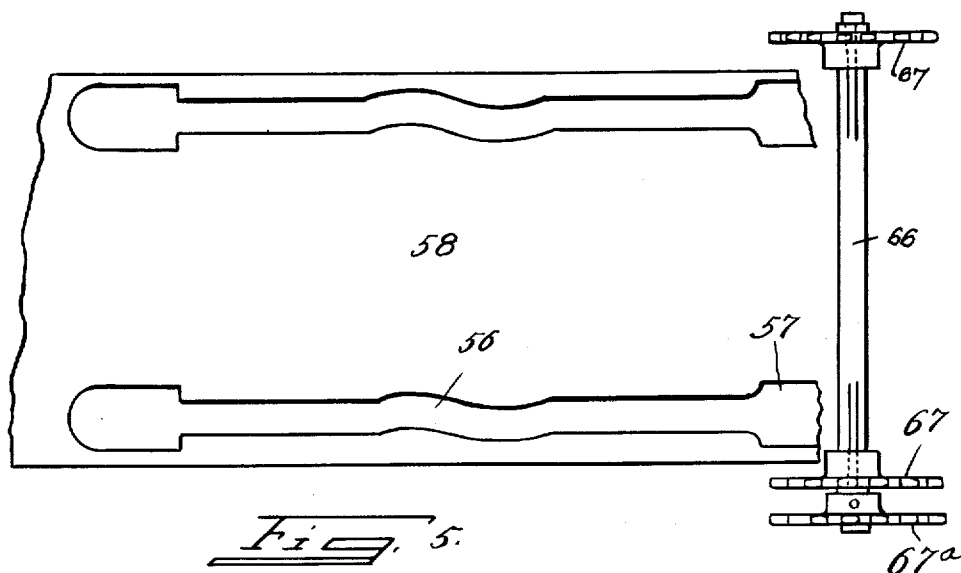
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UNITED STATES PATENT OFFICE.

JOHN Q. SHERMAN AND ALBERT W. METZNER, OF DAYTON, OHIO; SAID METZNER
ASSIGNOR TO SAID SHERMAN.

FLAT-BED MANIFOLDING MACHINE.

Original application filed December 29, 1920, Serial No. 433,208, now Patent No. 1,529,555, dated March 10, 1925. Divided and this application filed January 30, 1925. Serial No. 5,729.

This application is a division of our Patent No. 1,529,555, dated March 10, 1925.

Our invention relates to flat bed manifolders of the type wherein there are a number of webs of paper with forms imprinted upon the webs, the problem being to feed these webs in a convenient manner, and to align them accurately for receiving correctly located impressions upon all superimposed forms.

Among other things our invention is directed to means for supplying paper webs from a storage cabinet, in proper condition of alignment both longitudinally and laterally and in doing this without any separate manual operation over and above those done in feeding the paper over the machine platen after they have been written upon.

We also provide means for insuring a proper riding of the paper webs over the carbon paper employed in duplication of the impressions formed upon the topmost web, and further extend the usefulness of this means so as to serve as a member for breaking loose adhesions of carbon paper to the webs fed between it.

We have found that where a large number of webs of paper and carbon paper are used that it is very difficult to get proper feed and registration, and our invention is directed to the handling of up to a dozen or more webs of paper, as well as to the usual two or three copies usually employed in the autographic type of manifold.

These objects and other advantages to be noted below, we accomplish by that certain construction and arrangement of parts to be hereinafter more specifically pointed out and claimed.

In the drawings:

Figure 1 is a side elevation of the typewriter manifold embodiment of our invention.

Figure 2 is a continuation of Figure 1, the first two together making up a complete side elevation.

Figure 3 is a detail perspective of the movable device for safeguarding the paper webs for a smooth sliding over the carbon paper, and also for jogging loose carbon paper adhesions.

Figure 4 is a view of the paper roll spindle.

Figure 5 is a detail plan view of the cover

plate and sprockets of the storage cabinet feeding devices.

Figure 6 is a plan view detail of the traveling bar carrying the form engaging pins of the storage feeding device.

In a manifolding machine, such as those used in typewriting a large number of copies upon various business forms the provision of various safeguarding mechanism is obligatory. The feed is preferably of the adjustable friction disk type, as applied to autographic registers. Referring to Figures 1, 2 and 3, it will be noted that the paper passes over the platen interleaved with carbon paper, which it will be understood is mounted in some suitable way so as to pass in separate sheets or webs, transversely of the path of the paper over the platen.

The friction or tension rollers is mounted on the ends of arms, which are pivoted at alongside of the platen, and impelled by springs, to maintain the roller down against the feeding devices. For purpose of clearness the operating handle aligning pin and feed shaft are shown, but no other parts of the paper feed other than the cam member. The feed will be of the adjustable friction disk type to which we have referred in our application Serial No. 1,858, in which alignment is made by alignment pins aligning holes in the paper.

The various webs of paper on which the forms to be filled out are printed, pass onto the frame of the typewriter manifold over a carbon paper guarding device. Thus there are a pair of channeled uprights at each side of the back end of the machine, these uprights being adapted to receive a plurality of shafts or bars, which have enlarged heads to serve as spacers. The paper webs are brought up over these bars or shafts, and thus separated from each other. On each bar is mounted a pair of semi-flexible sheets, which may be of thin metal or other material, and which extend from the bars, forwardly of the machine, passing over a roll or bar, and arranged at their forward ends so that between the two leaves of each pair is a sheet of the carbon paper.

The roll or bar is mounted on a pair of extensions, from the two uprights, hitherto mentioned, and the structure of the two uprights and two extensions is mounted on the inside of the machine frame

so that it will slide longitudinally thereof.

Preferably a channeled guide 47 is provided for each side of the frame, just below its upper edge, with the extensions 46 provided with a rib 48 to slide in said guides, one or both of the extensions having a handle 49 by means of which the movement is accomplished.

When the webs of paper to be written upon are brought up spaced between the guard carrying bars or rolls and led forward over the platen, they will be separated by the shield or guards made up of the pairs of sheets 44. The carbon paper is interleaved between the webs of paper, but the meeting edges of the carbon paper sheets are set between the ends of the shields, which extend forward far enough to engage the edges of the carbon paper.

After the writing has been done, and it is desired to feed the webs forwardly over the platen, the operator may move the shield carrying frame structure forwardly, so as to run the various shields in between the carbon paper and the paper written upon, thereby breaking up any adhesions, and smoothing out the assembly so that it will feed regularly without unequal friction or pull back. As has been stated, we have found that one of the chief difficulties in the handling of a large number of webs of paper together with interleaved carbon paper is that the carbon paper, unless of perfect quality will stick to the paper, thereby causing trouble both in the paper feed, and in the destruction of the carbon paper.

It will be noted further that as a result of this device for freeing the webs of paper from all adhesions and shielding the carbon edges, the paper is put into a condition of hardly any friction or tension at all so that during the operation of the feeding devices there will be perfect freedom of adjustment of the webs on each other, when they are called to do so.

It is necessary, however, to provide a loose portion of paper between the storage devices, in which the paper is stored in rolls of convenient size, and the writing mechanism. Unless this is done, the paper will not be free for the adjustment referred to.

In order to do this we provide a method of withdrawing the webs of paper from the feeding device, and maintaining a loop of paper at all times, by means of coupling up the paper feed now described with the storage cabinet feed, and leaving a loop of paper in an amount sufficient to leave a freely hanging portion at all times between the two feeds.

Thus there is the cabinet 50, in which the paper is stored in rolls 51, said paper being mounted on spindles 52, which have core filling disks 53 thereon.

The paper then passes up over interspaced

idler rolls 54, and thence over a plate 55, which has formed lengthwise thereof slots 56, having a wavy outline, and terminating in large ends 57. A top plate 58 having like slots therein, is hinged at 59 to the cabinet, and when folded down over the paper, is spaced away therefrom and rests against a stop 60, on a bracket at the forward end of the cabinet. At this point a latch 61 engages a nose 62 on the end of the plate, this latching device being duplicated on each side of the machine, by preference. The plate has curled ends for hinging at 59, and engaging the abutment 60.

Mounted on a fixed shaft 63, beneath the supporting plate for the paper webs, are sprockets 64 and mounted in a bar 65, is another shaft 66, which also carries sprockets 67 similar to the sprockets first mentioned. In Figure 5 the sprocket arrangement is the same as for shaft 63 and the sprockets 64 thereon.

The bar 65 is adjustable in its position lengthwise of the cabinet, by means of guides 68 in which the bar slides, and screws 69 engaging in the bar, and in screw blocks 70 at the forward ends of the guides, a set screw 71 being used to lock the adjusted position of the said bar. This bar is adjusted in order to give proper tension to the chain 73^a to be later described.

A like sprocket to the ones mentioned is mounted on the feed shaft of the writing mechanism, as shown at 72, so that when the feed shaft is revolved the sprocket 72 is revolved, and a chain 73 is passed over the outer sprocket 64 and over the sprocket 72, so as to drive the shaft 63. Chains 73^a pass over the sprockets 64 at both ends of the shaft 63 and over the two sprockets 67 on shaft 66. The extra sprocket 67^a on shaft 66 is for use in case a separate drive is employed. The chains 73^a are adjustable as in any chain by adding or subtracting links where this is necessary.

Mounted at desired points on the chain, and spaced apart the length of the desired length of paper to be fed, are short bracket pieces 74, which, as shown, are formed with channeled ends 75, which are embraced with removable chain links 76, so as to be positioned as desired in the chains.

The brackets carry cap screws 77 which engage in elongated slots 78, in cross bars 79, which are thus carried by the chains and are free to oscillate. These bars carry pins 80, which will enter the holes in the heads of the forms and as the chains are moved will feed the forms forwardly from the storage cabinet into a loop 81 arranged between the storage cabinet and the frame of the writing mechanism. The pins 80 are arranged, by proper location of the bars, to enter the usual filing holes at the heads of printed forms on the paper to be fed. Thus

the pins serve to move the paper webs along from the storage space to the loop 81. The offsets 56 in the slots of the top plate 58 serve to jog the pins so that the paper webs will settle down smoothly over the pins, thereby accomplishing an alignment of the webs by means of the pin engagement due to the jogging and feeding movement. The chains are not deflected, since the bars have a slotted connection 78, thus permitting the bars to move laterally.

It should be understood that in referring to the number of pins used and the position of the holes, we are merely referring to a convenient arrangement and not intending to limit the scope of our invention.

A full complement of bars and pins is not shown, but it will be understood that the webs of paper will be arranged so that the pins will enter the holes in the continuous web and feed along a full lengthed form or check each time that the paper feed is operated in the writing mechanism.

Should it be desired to operate the paper feed by electric motor, this will be readily possible in the mechanism now described, either for the autographic type or the larger machines using more paper.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character described, a storage cabinet for a plurality of webs of paper, and a feeding means for withdrawing desired length sections of said paper from the storage cabinet comprising a pair of chains, means for guiding said chains in a level path, pin bearing means having a pin thereon adapted to engage a hole formed in the paper web, and means for mounting said pin bearing means on the chains, and for imparting an oscillatory movement to the said pin bearing means during the movement of the chains.

2. A paper feeding mechanism adapted to feed and align a plurality of webs of paper, comprising a support for the paper and a pair of flexible endless operating elements movable through a level feeding path, pin bearing means mounted on said elements, pins thereon adapted to engage holes formed in the paper webs, and means for imparting an oscillatory movement to said pin bearing means during the movement of the operating elements.

3. A paper feeding mechanism adapted to feed and align a plurality of webs of paper, comprising a support for the paper, means for supplying webs of paper for feeding over said support, a pair of flexible operating elements movable through a level feeding path beneath said support, a pin carrier secured to and movable with said flexible elements, said carrier being free to slide longitudinally on its mounting, and

pins on the carrier adapted to pass up through said support, to engage holes formed in the paper, and means for imparting longitudinal movement to the carrier during its movement with the flexible elements, whereby the pins are given an oscillatory movement.

4. A paper feeding mechanism adapted to feed and align a plurality of webs of paper, comprising a support for the paper, and a pair of flexible endless operating elements movable on said elements, pins thereon adapted to engage holes formed in the paper webs, and means for imparting an oscillatory movement to said pin bearing means during the movement of the operating elements, comprising slots in the support through which the pins pass, said slots having a wavy outline.

5. A paper feeding mechanism adapted to feed and align a plurality of webs of paper, comprising a support for the paper, and a pair of flexible endless operating elements movable on said elements, pins thereon adapted to engage holes formed in the paper webs, and means for imparting an oscillatory movement to said pin bearing means during the movement of the operating elements, comprising slots in the support through which the pins pass, said slots having a wavy outline, a cover member to come down over the paper on said support, and means for retaining said cover over the paper without frictional contact therewith.

6. In a paper feeding device for machines of the character described, the combination with a paper support, and means for supplying paper thereto, of a pair of endless operating elements, a pin carrying bar mounted on said operating elements, pins on the bar to extend upwardly in the support and engage holes in the paper thereon, a cross shaft, means for adjustably mounting the cross shaft, whereby its position with relation to the support may be adjusted, and means on the cross shaft for receiving the endless elements, the adjustment of the shaft with relation to the support determining the length of feed of the paper.

7. In a paper feeding mechanism of the character described, the combination with a support and means to supply paper thereto, of a pair of shafts, endless operating members passing around said shafts, means for operating one of said shafts at least, a pin carrying bar mounted across between the operating members and by them carried along the support, pins on the bar extending above the surface of the support to engage holes in the paper, one of said shafts being adjustable with relation to the other to determine the length of feed, said endless members being adapted to be shortened to correspond to the mutual adjustment of the shafts.

8. In a paper feeding mechanism of the character described, the combination with a support and means to supply paper thereto, of a pair of shafts, endless operating members passing around said shafts, means for operating one of said shafts at least, a pin carrying bar mounted across between the operating members and by them carried along the support, pins on the bar extending above the surface of the support to engage holes in the paper, one of said shafts being adjustable with relation to the other, said support for the paper having slots of wavy outline therein, to impart an oscillatory movement to the pins on said bar.

9. In a manifolding machine, the combination with a support over which webs of paper pass, said webs having feed apertures formed therein, of a pin feeding device having a pin portion to engage the apertures in said webs, means for moving the pin feeding device through a path along with the paper, and a guiding element adapted to impart to the pin portion thereof, a mo-

tion in part crosswise of the path of the paper, thereby aligning the paper webs laterally, and the movement of the device with the paper serving to align the webs lengthwise.

10. In a manifolding machine having means for moving a plurality of webs of paper beneath a typewriter carriage, in full length sections at a time instead of step by step, a mechanism for delivering to said feed device a plurality of webs of paper in alignment both lengthwise and laterally, said mechanism comprising a support for paper storage, a bed over which the webs of paper pass, a pin feeding device mounted to move along said bed in the path of the paper, and having a pin portion to engage apertures in the webs of paper, and a guiding means to impart movement of the pin portion transverse its path of movement with the paper, whereby the object named above is accomplished.

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