Dec. 22, 1931. O. KLEINSCHMIT 1,837,910

PAPER FOLDING AND WIRE STITCHING MACHINE

Filed Oct. 5, 1929 3 Sheets-Sheet 1

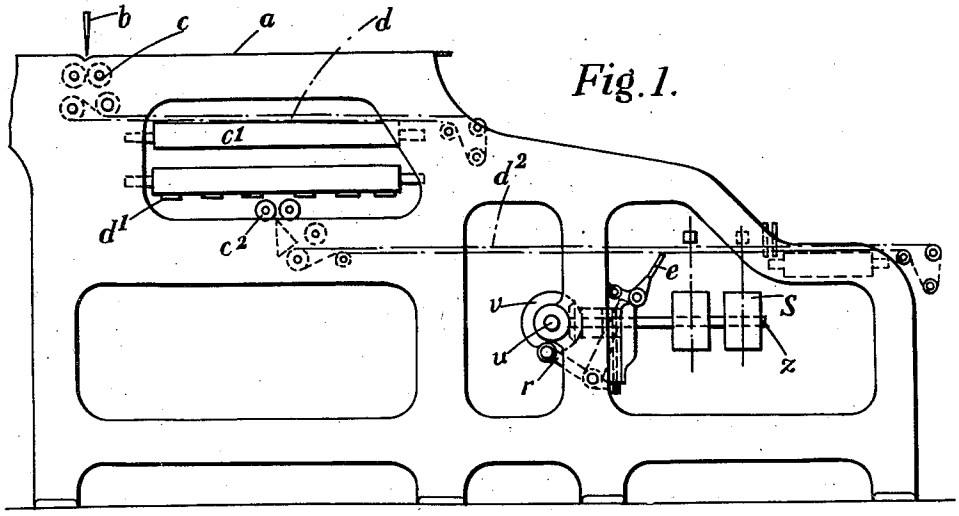


Fig. 1.

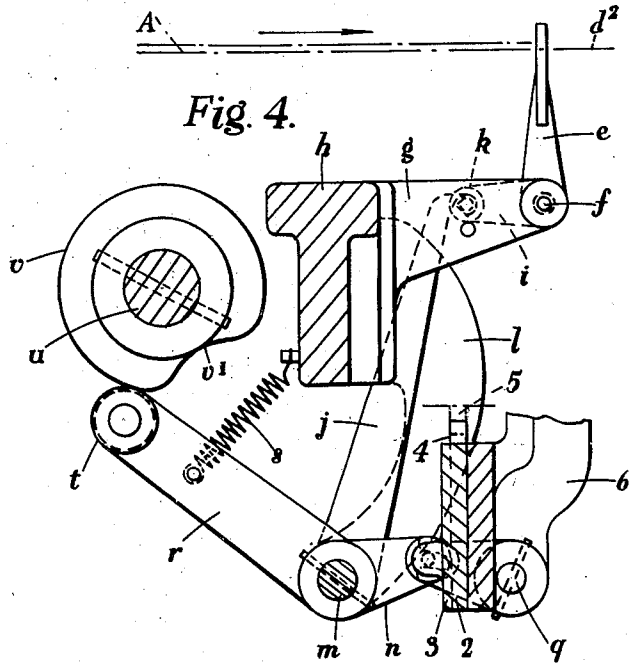


Fig. 4.

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Fig. 2.

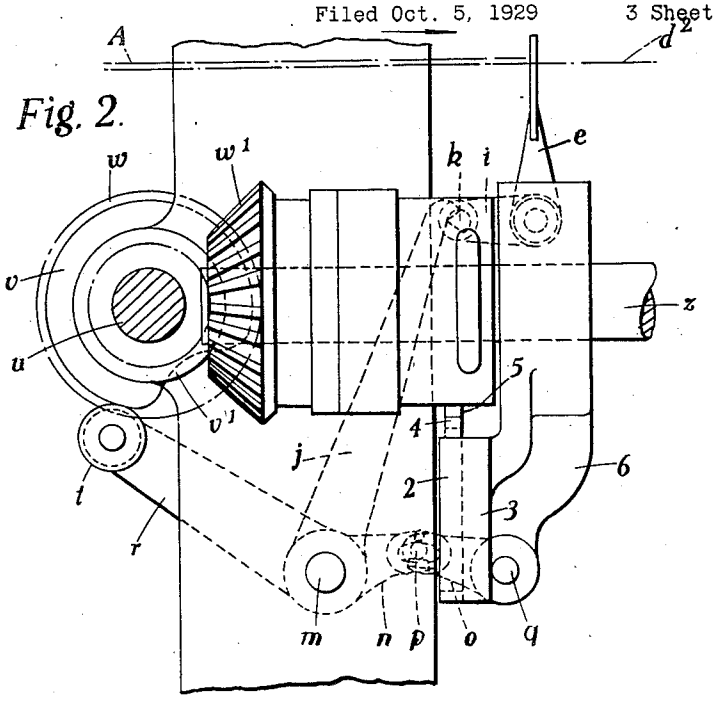
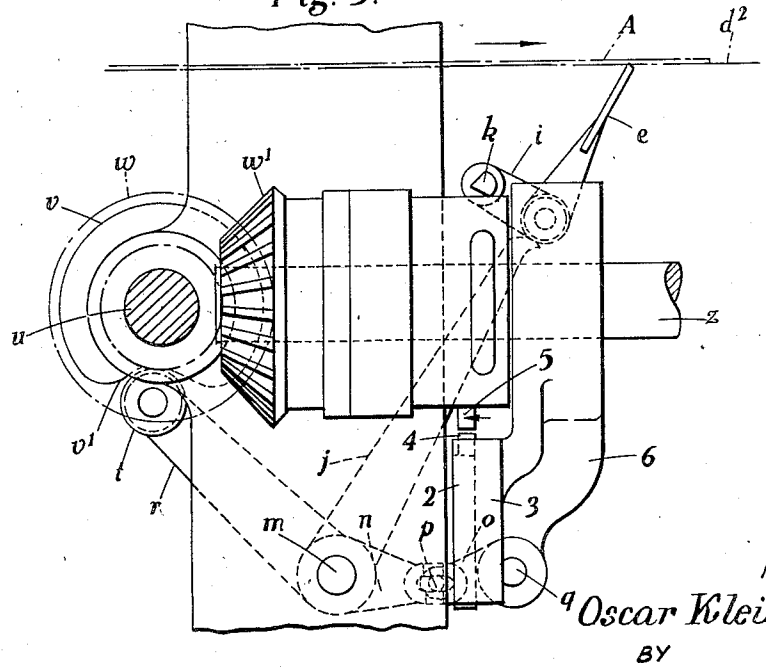


Fig. 3.



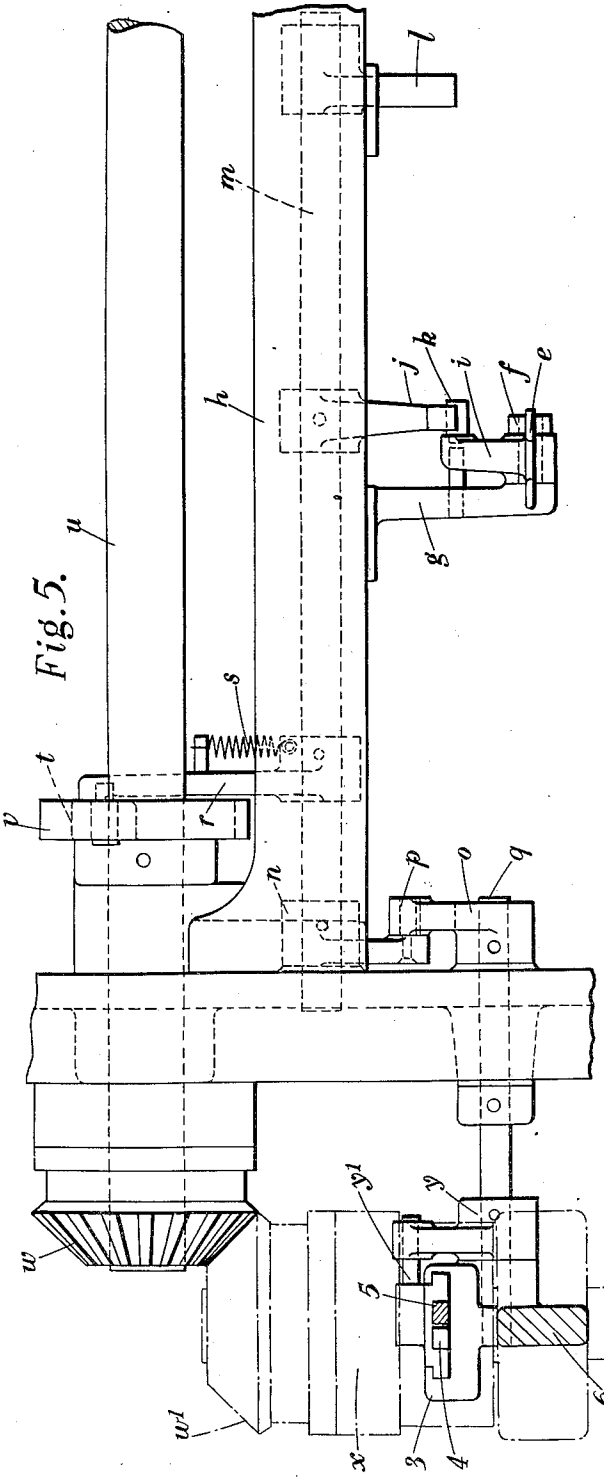
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Fig. 5.



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UNITED STATES PATENT OFFICE

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PAPER FOLDING AND WIRE STITCHING MACHINE

Application filed October 5, 1929. Serial No. 397,660.

This invention relates to paper folding and wire stitching machines by which sheets of paper are folded and bound together in the form of phamphlets or books, the single sheets being successively conveyed to a series of co-operating fold rolls and blades and from thence, prior to the last fold of the signature being completed, to the wire stitching mechanism where the requisite number of wire staples are applied.

If a machine of this type is inadvertently thrown into operation or allowed to run idly, when there is no material being dealt with by the folding mechanism, the stapling mechanism continues to operate, with the result that the staples are fed, at the predetermined point in the path of travel of the folded sheet as if such were present, and are apt to clog the stitcher heads. This disadvantage is obviated by the present invention as according thereto the stapling mechanism is only operated to feed the staples when a signature is actually present and in the course of its travel to the stitcher heads.

The means employed for carrying out the invention may be operated mechanically, electrically or magnetically.

I may for example employ a pivoted detector adapted to project into the path of travel of, and to be tripped by, the folded sheet thereby throwing in clutch mechanism whereby the stapling mechanism is put into operation. By this means the staples are only fed when there is a signature actually present during the regular working of the machine when one sheet follows another continuously and they are successively dealt with by the folding mechanism.

The construction of the clutch and the construction and arrangement of the parts that are operated by the travelling sheet may be of any convenient kind but in order that the invention may be readily understood and carried into practice I have illustrated a convenient form of mechanism in the accompanying drawings in which similar reference characters relate to like parts throughout the several figures and in which:—

Figure 1 is a general view of the machine partly diagrammatic and showing the application of my invention thereto.

Figures 2, 3, 4 and 5 are detail views to a larger scale.

Figures 2 and 3 show alternative positions of the detector and the parts operated thereby,

Figure 4 is a similar view to Figure 2 partly in section with the clutch and the stapling mechanism driving shaft omitted and

Figure 5 is a plan view.

Referring first to Figure 1 of the said drawings, which shows somewhat diagrammatically the general features of the known type of machine previously referred to, it will be seen therefrom that a sheet of paper to be folded is placed on the folding table a and is forced by the blade b between the fold rolls c. The folded sheet is then carried on the tapes d to the next pair of fold rolls c' and from thence by the tapes d' to the next set of rolls c^2 where it receives a further fold and so on being eventually carried by the tapes d^2 beneath the heads of the stapling mechanism S where, prior to the last fold of the signature being effected, the requisite number of wire staples are applied thereto.

According to the present invention as previously explained a detector represented at e is placed in the path of the travelling sheet as shown in Figure 1 and this device and the manner in which the same is operated will now be described in detail with particular reference to Figures 2 to 5 of the drawings.

The detector e is pivotally mounted on the pin f carried by the bracket g secured to the cross bar h of the main frame of the machine. Also carried on the pin f is the lever i which carries a pin k with which one end of the detent lever j is adapted to engage. This detent lever j is mounted on the spindle m carried on brackets secured to the bar h, one of these brackets being shown at l. Mounted on the spindle m is a toggle lever n which interengages by means of the pin p with its co-acting toggle lever o mounted on the spindle q that is carried in the bracket 6 secured to the main frame of the machine.

Also fixed on the spindle m is the lever r

that is anchored to the bar h by the spring s and carries a roller t that contacts with the cam v mounted on the main shaft u, on the end of which is fixed the bevel wheel w that meshes with the bevel wheel w' mounted on the end of the shaft z driving the stapling mechanism.

The spindle q carries a lever y in which is mounted a pin y' that carries a slide 2 slidably mounted in the block 3 formed integral with the bracket 6. The upper end 4 of the slide 2 forms a stop adapted to project into the path of a stop 5 depending from the movable member of the clutch x mounted on the shaft z adjacent to the bevel wheel w'.

The operation of the parts described may be briefly indicated as follows:—

On the sheets folded in the manner previously described with reference to Figure 1 forming a signature A and carried on the tapes d^2 coming into contact in the course of their travel with the detector e, this being pivotally mounted on the pin f will be swung over thereby into the position shown in Figures 1 and 3 of the drawings. This movement of the detector e through the lever i frees the pin k from the detent lever j which accordingly falls from the position shown in Figures 2 and 4 into the position shown in Figure 3, thereby rocking the spindle m and swinging the lever r so that the roller t by action of the spring s is forced from its position on the high part of the cam v as shown in Figure 4 into the position shown in Figure 3 in which it engages with the recess v' of the cam v.

Simultaneously with this movement, due to the interconnection of the toggle levers n and o the spindle q is likewise rocked thus operating the lever y to draw down the slide 2 and thereby withdraw the pin 4 so that it is out of the path of the depending pin 5, whereupon the movable member of the clutch x is freed and the clutch x is thrown into engagement, with consequent rotation of the shaft z and the putting into operation of the stapling mechanism.

It will be understood that the shaft u is driven continuously from the main driving source of the machine so that the gear wheels w and w' are constantly rotated but this movement of rotation is only imparted to the shaft z driving the stapling mechanism when the clutch x is thrown in as previously explained, so that the stapling mechanism is only put into operation when a signature is actually being conveyed on the tapes d^2 and throws over and depresses the detector e.

What I claim is:—

In a signature stitching machine, stitching mechanism, signature feeding means, operating means for the stitching mechanism including a clutch disposed beneath said feeding means, a detector pivotally mounted on the machine and normally projecting into the path of the fed signatures and adapted to be displaced thereby to a plane below the path of the fed signatures, a pivotally mounted detent lever normally held in raised position by said detector and adapted to swing downwardly when said detector is displaced, a second lever connected to said detent lever, a main shaft carried by the machine, a cam on said shaft operatively engaged with said second lever to raise said detent lever, and means controlled by said detent lever to operate said clutch when said detector is displaced by contact with the fed signatures.

In testimony whereof I affix my signature.

OSCAR KLEINSCHMIT.