Nov. 24, 1931. O. KLEINSCHMIT ET AL 1,832,988

PAPER FOLDING MACHINE

Filed June 9, 1930 2 Sheets-Sheet 1

Fig. 1.

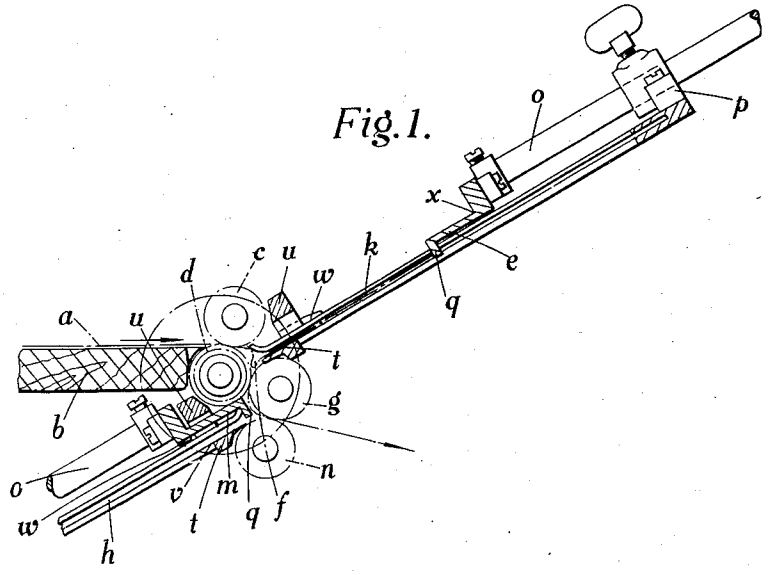



Fig. 2.

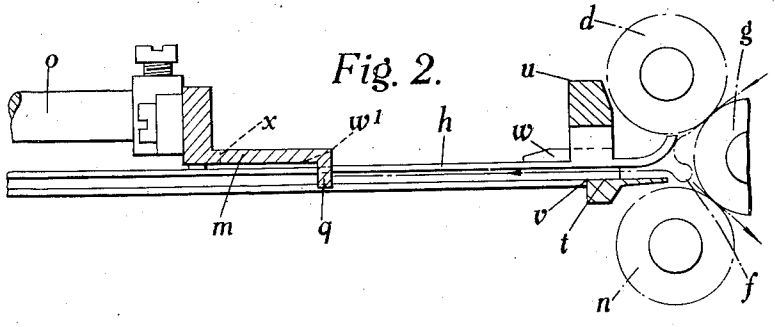
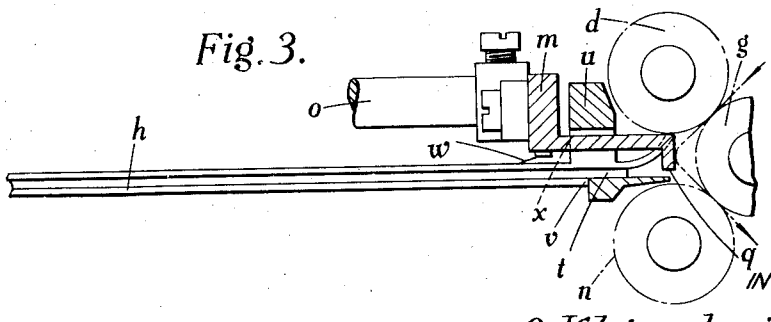



Fig. 3.




INVENTORS

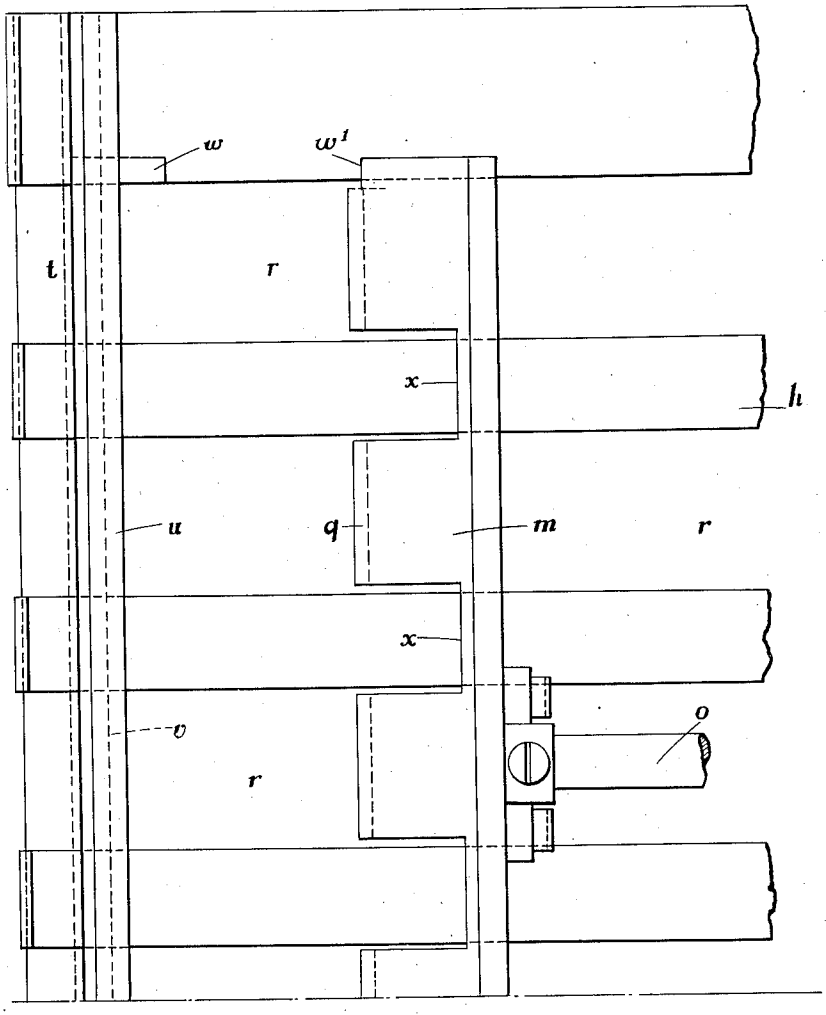
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*Fig. 4.*




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# UNITED STATES PATENT OFFICE

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## PAPER FOLDING MACHINE

Application filed June 9, 1930, Serial No. 460,024, and in Germany September 17, 1929.

This invention relates to improvements in paper folding machines and particularly to that class employing buckling plates or guides as a part of the machine for effecting one or more folds of the sheet of paper by means of the well known buckling process.

It sometimes happens that with this class of machine for various reasons it may be desirable to dispense with the employment of one or more of the buckling plates and to pass the sheet of paper through the buckling rollers without making a fold and generally when this is the case the buckling guide or guides is or are removed from the machine and deflecting devices are substituted therefor so that the sheet of paper passes directly through and is unaffected by the buckle folding rollers from whence it may be led to the ordinary folding roller and knife mechanism.

It has however been proposed to pivotally support the buckling plates or guides of such buckle folding mechanism whereby the same may be held out of the way and deflecting devices substituted therefor for the purpose described.

The present invention has for its object to provide improved means whereby the sheet to be folded may be deflected into the succeeding feed or folding rollers without any auxiliary being applied to the machine or the removal of the buckling plates or guides either bodily or by swinging the same out of the path of the feeding mechanism.

With this object in view according to the present invention the stop commonly employed to limit the travel of the sheet within the buckling plates or guides is so constructed and so mounted with respect to the said guides that it is adapted to act as a deflector and may be suitably positioned to deflect the sheet so that the same does not pass between the buckling plates but is deflected into or between the buckle folding rollers and from thence fed, if desired, to the ordinary folding rollers and knife machanism.

The invention further consists in the improved construction and adaptation of the buckling plates or guides in order that this dual function of the stop aforesaid may be attained as hereinafter described.

A construction according to the invention is illustrated by way of example in the accompanying drawings in which similar reference characters relate to like parts in all the figures and in which:—

Figure 1 is an elevation of part of a folding machine showing two sets of buckling plates or guides.

Figures 2 and 3 are similar views to a larger scale showing one set of the buckling plates or guides of Figure 1 with alternative positions of the stop and

Figure 4 is a plan view of a portion of one set of buckling plates and their co-acting stop, also to a larger scale than Figure 1.

It will be appreciated that as is usual in this class of machine the sheet *a* is fed from the feed table *b* by the rollers *c* and *d* into the buckling plates *k* where it strikes against the front edge of the adjustable stop *e* whereby a loop or buckle *f* is formed which is seized by the rollers *d* and *g* so that the first fold in the paper sheet is formed in the well known manner. The folded sheet is then passed by the rollers *d* and *g* into the buckling plates *h* and the operation is repeated so that a second fold is formed and so on.

Assuming now it is desired to dispense with the second buckle folding operation and that the once folded sheet is desired to be led either directly to the stack or to the ordinary folding roller and knife mechanism for effecting a transverse fold according to this invention the stop *m* of the buckling plates *h* is so constructed and so mounted with respect to the said plates that it may be caused to travel in its guides until it almost contacts with the roller *g* as shown in Figures 1 and 3 and closes the mouth of the guide pocket so that the folded sheet is deflected and passes directly between the rollers *g* and *n* as indicated by the arrowed line.

In order that any stop such as *e* or *m* associated with the buckling plates may fulfil the dual function of limiting the travel of the sheet within the buckling plates and also acting as a deflector, each stop, which is carried by the rods *o* slidably mounted in bear-

ings $p$ fixed to the guide frames is formed with depending teeth $q$ that are adapted to engage the slots $r$ formed in the guide frames (Figure 4). The upper slots of the buckling plates or guides extend longitudinally right to the front ends of the plates which are secured to the transverse member $t$ of the guide frame to which the bridge-bar $u$ is screwed or otherwise secured.

In order to prevent the teeth $q$ striking against the edge $v$ of the transverse member $t$ of the guide frame in the course of the travel of the stop to its lowermost position a lifter $w$ provided with an inclined surface is mounted on each side of the guide frame so that the inclined edge $w'$ of the stop rides thereon and thereby raises the teeth $q$ above the upper surface of the transverse member $t$, the front face $x$ of the stop coming into contact with the bridge-bar $u$ to limit the downward travel of the stop whilst the teeth $q$ pass beneath the bridge-bar $u$ as clearly seen in Figure 3.

What we claim is:—

1. In a paper folding machine of the kind described the combination with the feed rollers buckling rollers and buckling frames forming guide pockets of means adjustably mounted in said buckling frames and normally limiting the travel of a paper sheet from said feed rollers within said guide pockets and also acting as a deflector to prevent the entrance of a paper sheet from said feed rollers to said guide pockets, substantially as described.

2. A paper folding machine as claimed in claim 1 wherein said adjustably mounted means constitute a stop provided with teeth that engage in slots formed in the buckling frame.

3. A paper folding machine as claimed in claim 1 wherein lifters having inclined surfaces are provided on each of the buckling frames for the purpose described.

In testimony whereof we affix our signatures.

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