April 27, 1954 C. E. EMMER 2,676,659

CENTERING GUIDE MECHANISM

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Fig. 1

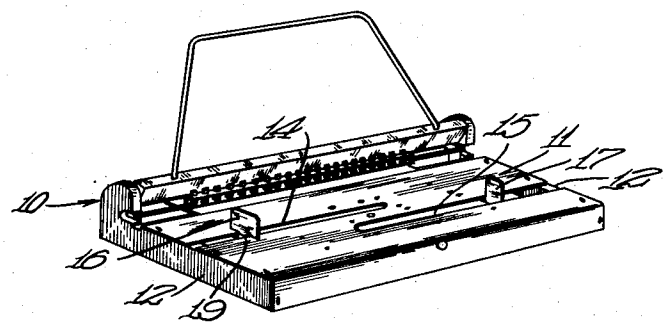


Fig. 2

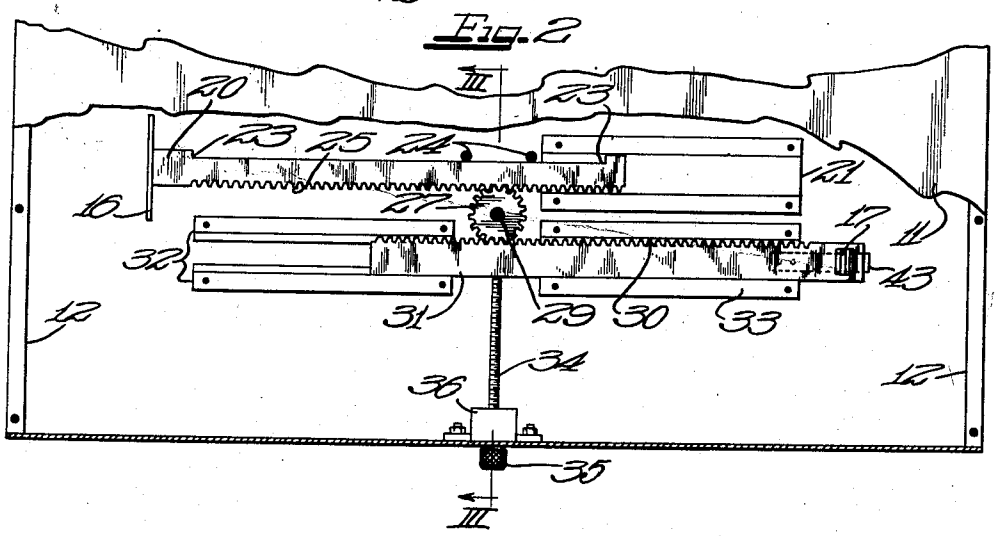


Fig. 3

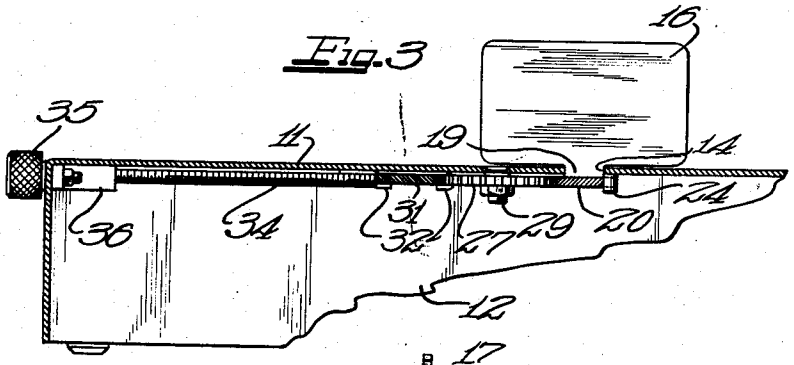


Fig. 4

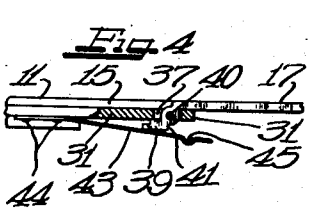
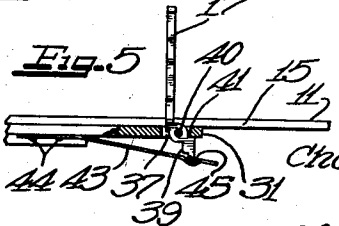


Fig. 5



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UNITED STATES PATENT OFFICE

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CENTERING GUIDE MECHANISM

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5 Claims. (Cl. 164—91)

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This invention relates to improvements in an aligning or centering guide mechanism adapted to center paper or the like for punching.

Certain printed or typewritten matter such as advertising circulars, bulletins, catalogs, instruction sheets, and reports are frequently bound in plastic ring-type binders having plastic backbones from which extend a plurality of curved teeth, which may be opened to receive the sheets when punched and may then be released to close and form a permanently bound volume. In order to bind the sheets, it is first necessary to accurately punch them and to hold them in position during the punching operation in the desired aligned or centered relation with respect to the punching dies, and since the sheets and binders may vary in size, it is desirable to have self-centering aligning guides for the sheets which will quickly and positively align the sheets for punching. The nature of the punching and aligning operation is such that it is usually done by hand, and since many volumes are usually bound in a day it is further desirable to have the aligning and guide means so arranged as to be of a simplified form and construction and to permit insertion and withdrawal of the sheets along the top of the punch table with little if any interference from the guiding mechanism, so the operator of the punch may slide the sheets lengthwise along the table of the punch against one of the guiding elements of the guiding mechanism, without taking the time to lift the sheets over the guides and insert them between the guides.

My invention has as its principal object to provide a novel and improved form of guide mechanism having guide elements engaging opposite side edges of sheets of paper to be punched, with one of the guide elements so arranged as to offer an unobstructed surface over which the sheets of paper may be moved into position for alignment and centering for punching.

Another object of my invention is to provide a novel and improved form of side guide mechanism particularly adapted to center paper or the like for punching, so arranged as to be readily movable out of the way of the paper when the sheets are being moved into position for centering or punching or are being withdrawn after the punching operation.

A further and more specific object of my invention is to provide a self-centering paper punching guide including two guide elements movable along the top surface of the table toward or from each other to center the sheets of paper to be punched, one of which elements may be collapsed for inserting or withdrawing the sheets of paper thereover without interruption.

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In carrying out my invention I mount two sliding elements beneath the top surface of a table or punching machine for movement along the table and connect these elements together by a gear so they will move together toward or from each other upon movement of one of the elements along the table. I further provide vertical side guide elements on each of these sliding elements which project upwardly from the top of the table and are guided for movement therealong, and I mount one of these elements on its sliding element for collapsible movement with respect thereto and for movement into position to extend vertically of the table to form an aligning guide element or to collapse with respect thereto by simple flicks of the finger.

These and other objects of my invention will appear from time to time as the folowing specification proceeds and with reference to the accompanying drawings wherein:

Figure 1 is a perspective view of a punch having a self-centering guide mechanism constructed in accordance with my invention embodied therein;

Figure 2 is a fragmentary plan view of the table for the punch, with part of the top of the table broken away in order to show certain details of the self-centering side guide mechanism;

Figure 3 is a fragmentary transverse sectional view taken substantially along line III—III of Figure 2;

Figure 4 is an enlarged detail view with certain parts shown in substantially longitudinal section and showing the movable side guide in a collapsed position with respect to the punch table; and

Figure 5 is a view somewhat similar to Figure 4 but showing the movable side guide locked in a vertically extended position.

In the drawings:

A gang punching machine 10 is shown, which may be of a type generally used to punch a plurality of holes in sheets of paper for binding with plastic binders. The gang punch 10 is herein shown for illustrative purposes only, to illustrate an application of my invention and may be of a form somewhat similar to that shown and described in my application Serial No. 771,161, filed August 29, 1947, now Patent No. 2,638,986, and entitled "Portable Punching Machine."

The punching machine 10 includes generally a

flat plate 11, the top of which forms a table supporting the sheets to be punched. The plate 11 is mounted at its ends on side frame members 12, 12 and is shown in Figure 1 as being bent downwardly over the advance ends of said side frame members to close the forward end of the punching machine. The plate 11, as herein shown, has two slots 14 and 15 extending therealong for a portion of the length thereof and each opening to an opposite outer edge of said plate. The slots 14 and 15 form guides for side guide elements 16 and 17 guided therein for movement therealong and adapted to be inserted in said slots from the open ends thereof during assembly of the mechanism. The side guide element 16, as shown in Figure 3, has a depending tab 19 extending downwardly through the slot 14 and secured to the top surface of a sliding element 20, for movement therewith. The guide element 16 may rest on its undersurface on the top of the plate 11 and form a support for one end of the sliding element 20. The opposite end of the sliding element 20 is supported and guided in a rectilinear guide 21 secured to the bottom of the plate 11 on opposite sides of the element 20, and extending downwardly along opposite sides of said element and across the bottom thereof. The rear face of the sliding element 20 is recessed to form opposite shouldered ends 23, 23 adapted to be engaged by pins 24, 24 which form stops to limit rectilinear travel of said sliding element. The stops 24, 24 also serve as abutment members to hold rack teeth 25 on the opposite side of said sliding element from the pins 24, 24 into mesh with the teeth of a pinion 27. The pinion 27 is rotatably mounted beneath the top of the plate 11 on a pin 29 secured to and depending from said plate. The pinion 27 also meshes with rack teeth 30, cut along one side of a sliding element 31 carrying the side guide element 17. The sliding element 31 is slidably supported on the bottom of the plate 11 for movement therealong in parallel relation with respect to the sliding element 20 on spaced gibbed guiding members 32, 32 and 33, 33. The guiding members 32, 32 and 33, 33 are secured to the bottom of plate 11 on opposite sides of the pinion 27 and have supporting guiding engagement with the undersides and opposite edges of the sliding element 31.

Thus, when the side guide element 16 is moved along the table 11 the side guide element 17 will be moved along said table toward or from the side guide element 16 by means of the rack 25, pinion 27 and rack 30 to accurately center the paper with respect to the punches of the gang punch 10.

A locking screw 34 engageable at its inner end with the forward side of the sliding element 31, in alignment with the pin 29 and pinion 27, is provided to lock the side guide elements 16 and 17 in the desired position of adjustment. As herein shown, the locking screw 34 extends through the downwardly turned forward end portion of the plate 11 to a position adjacent the sliding element 31 and is threaded within a block 36 secured to the inside of the downwardly turned forward end portion of said plate. A knurled head 35 of said locking screw is on the outer side of said forward end portion of said plate and affords a convenient means for turning said screw by hand.

The collapsible side guide element 17 is shown in Figures 4 and 5 as extending through a transverse slot 37 formed in the sliding element 31 and as having an offset projecting locking end 39 depending therefrom. The portion of the collapsible side guide 17 within the slot 37 is of a boss-like formation, offset to one side of the upwardly projecting portion of said side guide element, and pivotally mounted on the sliding element 31 within the slot 37 on a transverse pivotal pin 40. The offset locking end 39 of the collapsible guide element 17 is offset to the opposite side of the pivotal pin 40 from the vertically extending guide portion of said guide element, and has an upwardly facing shoulder 41. The shoulder 41 is engageable with the bottom surface of the sliding element 31 adjacent the outer edge of the slot 37 and held in engagement therewith by a leaf spring 43. The leaf spring 43 is secured adjacent one of its ends to the bottom surface of the sliding element 31 in spaced relation with respect to the slot 37, as by rivets 44, 44, and has a transversely extending upwardly opening recess or notch 45 formed therein adjacent its outer end. The notch 45 is engaged by the end portion of the locking end 39 of the side guide element 17, to lock said side guide in a vertical position and to permit said side guide element to be readily flicked by the finger into the collapsed position within the slot 15, beneath the top surface of the table 11, and offer no resistance to the passage of sheets over the surface of the table.

It may be seen from the foregoing that a new and improved form of self-centering paper punching guide has been provided, one of the side guide elements of which is collapsible out of the way of the paper being inserted for punching or withdrawn after the punching operation by a simple flick of the finger. Thus, after the proper side positions have been determined for the sheets to be punched and the centering mechanism is locked in position by the locking screw 34 the side guide element 17 may be flicked downwardly into the slot 15 beneath the surface of the plate 11, and permit the sheets to be moved into position against the side guide element 16 with a sliding motion along the top of the table of the punching machine.

It should here be noted that since two parallel side guide elements are used that said elements may be either flat as shown or may be round to avoid the necessity of having the guide exactly perpendicular to the back gauge of the punch, since the important factor in the punching of paper for binding is that the punch holes be parallel to the edges of the bound sides of the sheets. It should also be noted that the collapsible guide element need not be recessed beneath the top of the table when collapsed, as long as it offers an uninterrupted surface over which the paper may pass, and that it may be detachable as well as collapsible or instead of collapsible if desired.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. In an aligning paper guide adapted to center paper or the like for punching, a table, two sliding elements mounted beneath said table for movement therealong and a gear connecting said elements together and transferring the motion of one of said elements to the other, causing said elements to move together or apart upon movement of one of said elements, a vertical guide element mounted on one of said elements and extending vertically along one side of said table and movable with said element for adjustable

movement along said table, and a collapsible guide element pivotally mounted on the other of said sliding elements and movable to extend vertically of said table in parallel relation with respect to said first guide element and to collapse with respect thereto, said collapsible guide element having a depending end extending beneath the pivotal axis thereof, and a leaf spring on said sliding element engageable with said depending end, for selectively holding said collapsible element in an extending or collapsed position.

2. In a paper centering and aligning guide adapted to center paper or the like for punching, a table, two sliding elements mounted beneath said table for movement therealong, and a gear connecting said elements together and transferring the motion of one of said elements to the other, causing said elements to move together or apart upon movement of one of said elements, said table having parallel spaced slotted portions extending therealong in alignment with said sliding elements, a vertical guide element extending along one side of said table and mounted on one of said sliding elements and guided for movement along one of said slotted portions, and a collapsible guide element pivotally mounted on the other of said sliding elements and guided for movement along the other of said slotted portions, said last named guide element being movable into a vertical guiding position parallel to said first element and being collapsible into its associated slotted portion to permit the uninterrupted insertion of sheets into and the withdrawal of sheets from said guide by movement along the top of said table, and yieldable locking means having yieldable engagement with said collapsible guide element, to hold it in a vertically extended or collapsed position.

3. In a paper centering and aligning guide adapted to center paper or the like for punching, a table, two sliding elements mounted beneath said table for movement therealong and a gear connecting said elements together and transferring the motion of one of said elements to the other, causing said elements to move together or apart upon movement of one of said elements, said table having parallel spaced slotted portions extending therealong in alignment with said sliding element disposed therebeneath, a vertical guide element extending along one side of said table and mounted on one of said sliding elements and guided for movement along one of said slotted portions, a collapsible guide element pivotally mounted on the other of said sliding elements and guided for movement along the other of said slotted portions, said last named guide element being movable into a vertical guiding position in parallel relation with respect to said first element and being collapsible into its associated slotted portion to permit the uninterrupted insertion of sheets into and the withdrawal of sheets from said guide along the top of said table, said collapsible guide element having a depending portion extending from said associated sliding element, and a leaf spring member secured to said sliding element and having a transverse notch formed therein engageable with the end of said depending portion of said guide element, and releasably locking said guide element in a vertically extended or collapsed position.

4. In an aligning paper guide adapted to center paper or the like for punching, a table, two sliding elements mounted beneath said table for movement therealong and means connecting said elements together and transferring the motion of one of said elements to the other, causing said elements to move together or apart upon movement of one of said elements, a vertical guide element mounted on one of said elements and extending vertically along one side of said table and movable with said element for adjustable movement along said table, and a collapsible guide element pivotally mounted on the other of said sliding elements and movable to extend vertically of said table in parallel relation with respect to said first guide element and to collapse with respect thereto, said collapsible guide element having a depending end extending beneath the pivotal axis thereof, and a leaf spring on said sliding element engageable with said depending end, for selectively holding said collapsible element in an extended or collapsed position.

5. In a paper centering and aligning guide adapted to center paper or the like for punching, a table, a sliding element mounted beneath said table for movement therealong, said table having a slotted portion extending therealong in alignment with said sliding element, a collapsible guide element pivotally mounted on said sliding element and guided for movement along said slotted portion, said last named guide element being movable into a vertical guiding position and being collapsible into said associated slotted portion to permit the uninterrupted insertion of sheets into and the withdrawal of sheets from said guide by movement along the top of said table, and yieldable locking means having yieldable engagement with said collapsible guide element, to hold it in a vertically extended or collapsed position.

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