June 18, 1935. A. G. PIERCE 2,005,693

ALIGNING DEVICE FOR MANIFOLDING TYPEWRITERS

Filed Oct. 11, 1934 3 Sheets-Sheet 1

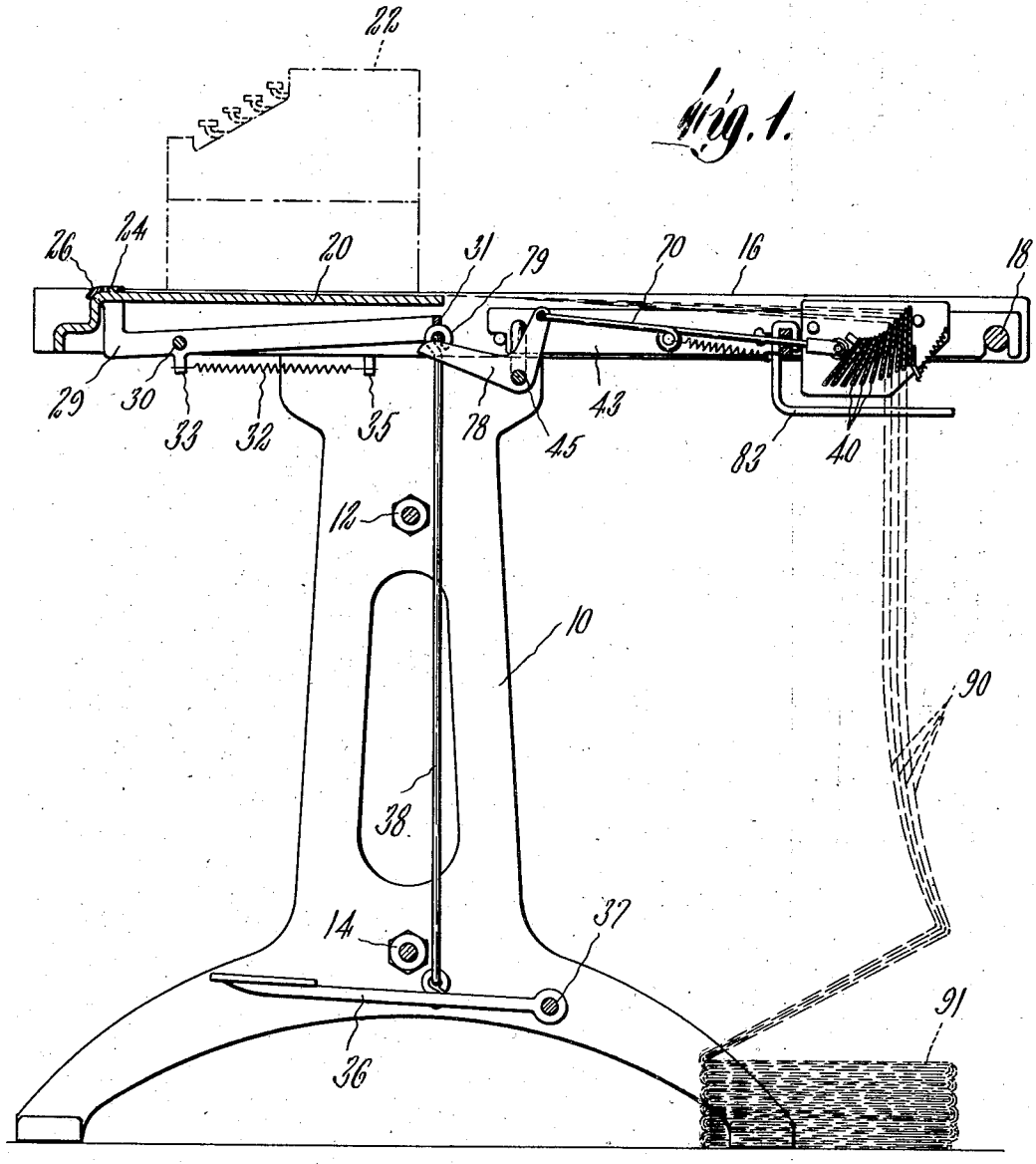

Fig. 1.

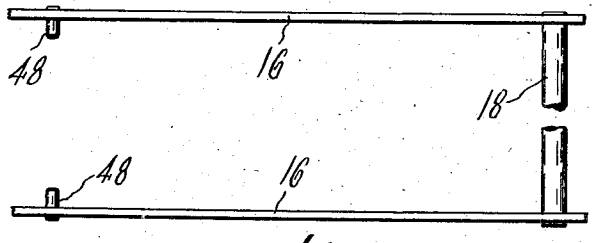

Fig. 2.

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ALIGNING DEVICE FOR MANIFOLDING TYPEWRITERS

Filed Oct. 11, 1934 3 Sheets-Sheet 2

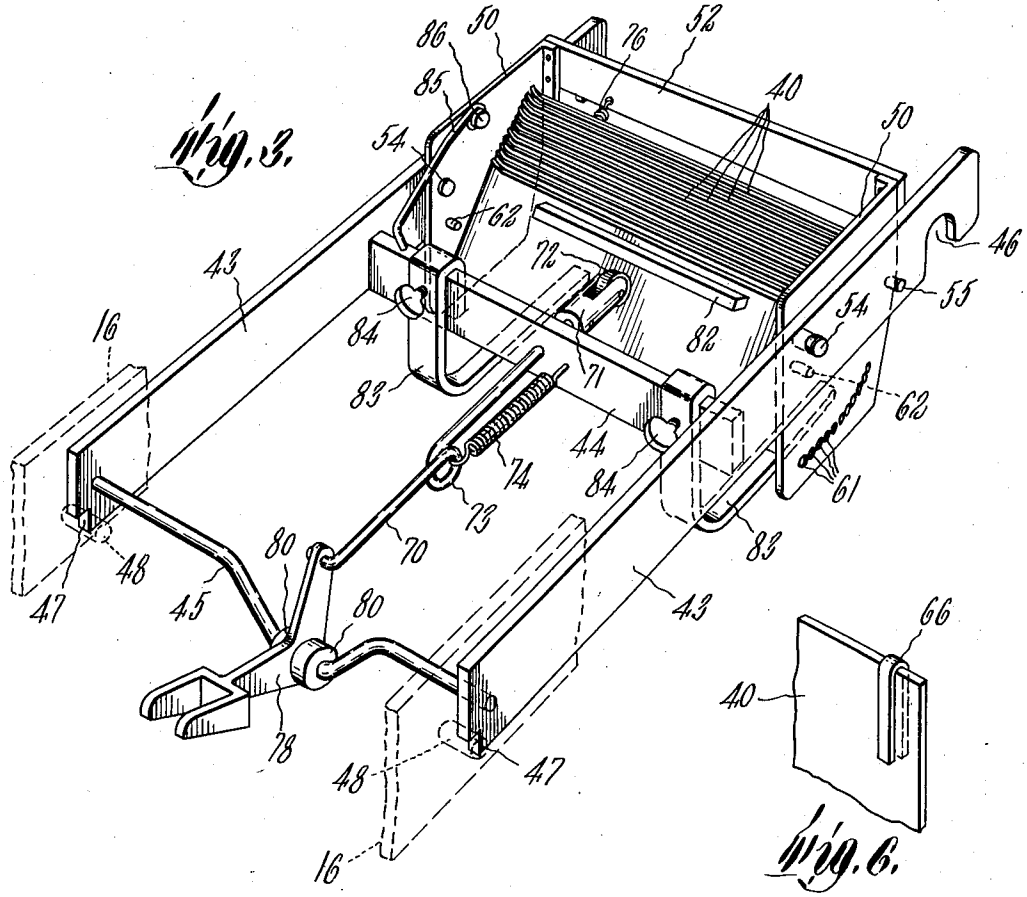

Fig. 3.

Fig. 6.

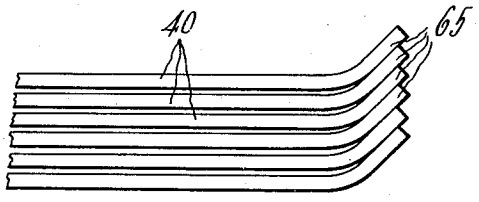

Fig. 5.

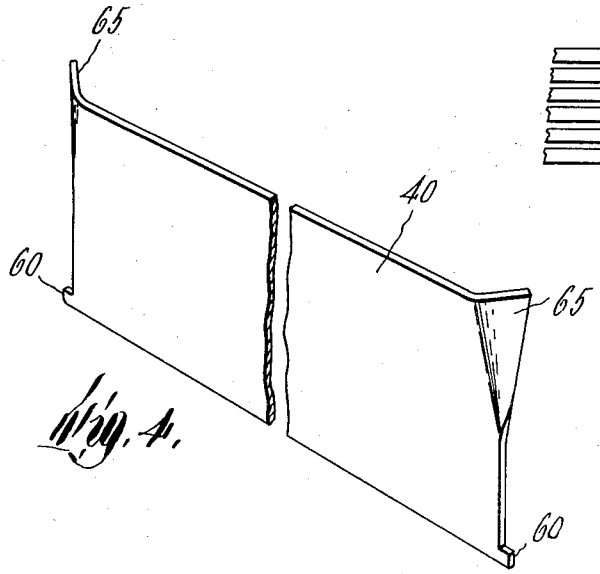

Fig. 4.

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ALIGNING DEVICE FOR MANIFOLDING TYPEWRITERS

Filed Oct. 11, 1934 3 Sheets-Sheet 3

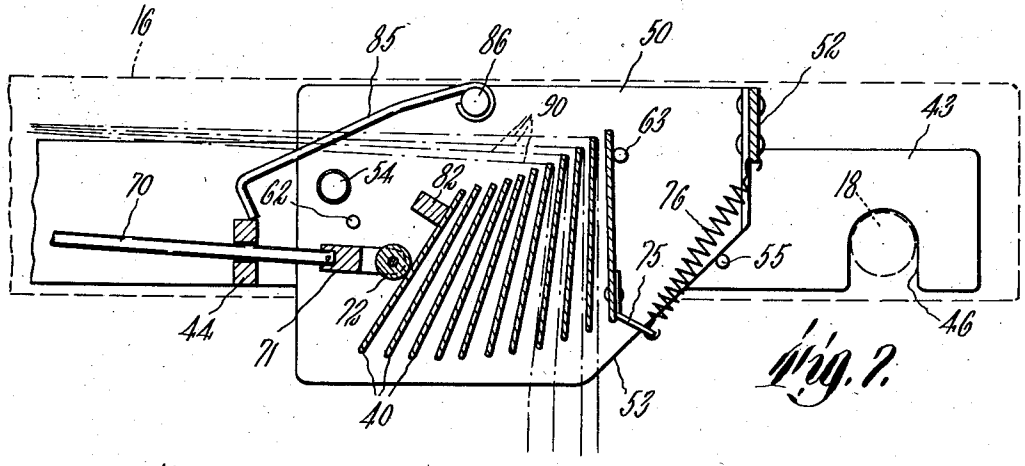

Fig. 7.

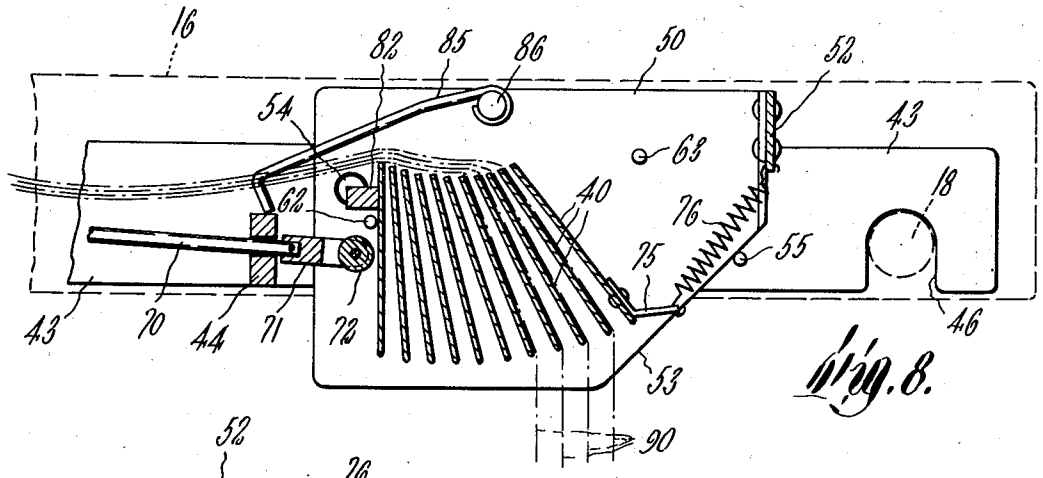

Fig. 8.

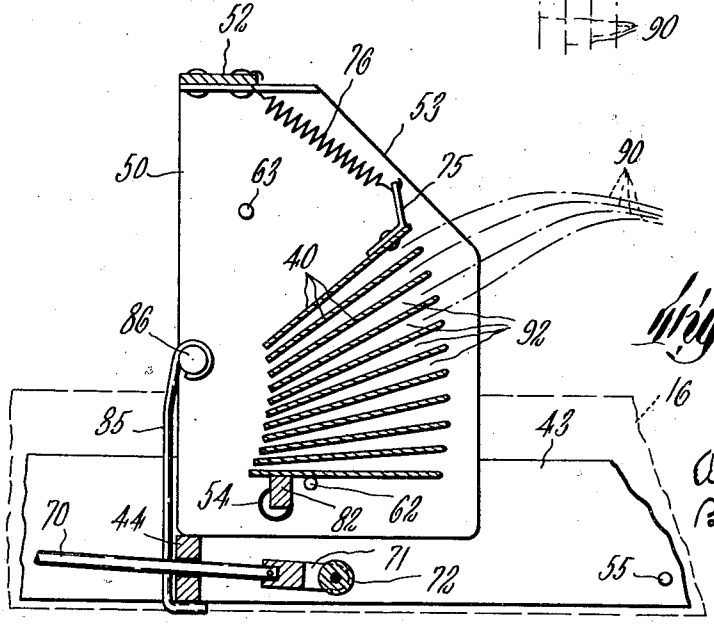

Fig. 9.

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Patented June 18, 1935 2,005,693

UNITED STATES PATENT OFFICE

2,005,693

ALIGNING DEVICE FOR MANIFOLDING TYPEWRITERS

Arthur G. Pierce, Quincy, Mass., assignor to Atlantic Register Company, Waltham, Mass., a corporation of Massachusetts

Application October 11, 1934, Serial No. 747,875

12 Claims. (Cl. 197—133)

This invention relates to a device for aligning a plurality of superposed continuous strips of paper or similar material for use in such machines as manifolding typewriters and is exemplified herein in a device adapted for use with a manifolding typewriter in which the platen is fixed and the typewriter is movable thereover in relation thereto.

In the use of manifolding typewriters of the foregoing type, it has heretofore been customary to use a plurality of continuous superposed strips of paper which are led over the platen from a supply generally located below the machine, which may be in the form of rolls or flat packs or in other forms. The paper strips are provided with printed forms suitable for the intended use, which forms are separated by transverse weakened lines or perforations so that when a form has been filled in by the typewriter, the paper strips may be pulled forwardly by the operator and the original and the copies of the filled-in form torn off. The forms are provided with filing holes and it has been customary in the use of these machines to provide a pair of small hooks in the front of the platen adapted to engage the filing holes in the forward ends of the paper strips to hold them against rearward movement, and a cross bar, having perforations for receiving the hooks, for holding the forward ends of the paper strips in place, this cross bar being adapted to be raised by a foot treadle when a form has been filled in, to permit the paper strips to be drawn forwardly and the filled-in form torn off using the cross bar as a tearing bar.

It is desirable and necessary for the paper strips to be held taut and smooth over the platen so that the printed forms on the various strips will be in register and alignment with each other and devices of various construction have been provided for use with machines of this type for aligning the paper so that in multiple copies, the forms will be in register, but most of these devices have been more or less complicated, cumbersome and not altogether satisfactory.

One of the important objects of my invention is the provision of an aligning device capable of being mounted without the use of any fastening means on the usual stand provided for typewriters of this kind.

Another important object of the invention is the provision of a device simple and compact in construction, efficient in operation and which can be made and installed at a very low cost.

Another object is the provision of an aligning device which is adapted to be operated by the raising and lowering of the tearing member so that when applied to a machine of this type the usual operations carried on by the operator have the effect of operating the aligning device.

A further object of the invention is the provision of a device which permits the strips of paper to be threaded through or adjusted in the device very quickly and without appreciable effort.

Other objects of the invention will be more specifically set forth and described hereinafter.

Briefly, my invention contemplates in its preferred form a series of aligning leaves pivotally mounted at their lower edges in a suitable support and spaced apart to accommodate a continuous strip of paper between each two adjacent leaves. The paper strips which are directed upwardly from a supply beneath the aligning device pass between the aligning leaves and are then turned horizontally to pass over the platen and under the operating mechanism of the typewriter toward the operator, means being provided to hold the forward ends of the strips against rearward movement. Normally, the aligning leaves are held in a retracted approximately vertical position to hold the paper strips straight and taut but means is provided whereby when the tearing member is raised the aligning leaves are turned through an appreciable angle toward the operator to permit the paper to be drawn forwardly without appreciable resistance from said leaves to bring a new form under the typewriter. When the tearing member is lowered the leaves are turned back to a normal approximately vertical position in which movement the upper edges of the aligning leaves tend to drag the paper strips rearwardly and to straighten and align them and to hold them in that position.

The support in which the aligning leaves are carried is preferably pivotally mounted in a frame so that it may be turned through an arc of approximately ninety degrees to facilitate the threading of the paper strips between the leaves when new strips are being inserted in the device. The frame is so constructed that it may be mounted on the typewriter stand as ordinarily constructed without requiring fastening means.

In the accompanying drawings illustrating one embodiment of the invention, Figure 1 is a side elevation partly in section of a typewriter and stand of the type, in which the body and operating mechanism of the typewriter are so mounted as to be relatively movable to the platen,

provided with a device constructed and adapted to be operated in accordance with my invention for aligning stationary folded zigzag to form a flat pack;

Fig. 2 is a plan view of the right hand portion of the stand shown in Figure 1 used for supporting the aligning device;

Fig. 3 is a view in perspective of an aligning device constructed in accordance with the invention, the parts being shown in normal position;

Fig. 4 is a view in perspective of an aligning leaf;

Fig. 5 is a plan view of one end of a group of leaves to illustrate the method of spacing the leaves by turning the upper end corners;

Fig. 6 is a perspective view of a corner of a leaf showing another form of spacing device;

Fig. 7 is a longitudinal sectional view of the device, the aligning leaves being shown in a normal retracted position;

Fig. 8 is a similar view with the aligning leaves in a forward position to permit the paper strips to be drawn forwardly and Fig. 9 is a similar view showing the leaf support turned upwardly to facilitate the threading of the paper strips between the aligning leaves.

Referring to Figure 1 of the drawings, there is shown a stand comprising a pair of standards or leg portions 10 fastened together in separated upright position by tie rods 12 and 14, which standards carry fixed thereto on edge a pair of parallel horizontal bars 16 connected together at their rear extended ends by a rod 18. Mounted on and between the front ends of the bars 16 adjacent the operator's seat is a platen 20 above which is arranged a typewriter 22 adapted for movement relative to the platen to write on strips of paper fed over the platen toward the operator from the rear ends of said bars.

For holding the forward ends of the paper strips in fixed position during the typewriting operation, a pair of upwardly projecting pins or hooks 24, adapted to engage suitable holes in the paper, are mounted in the forward edge of the platen and a transverse tearing member 26 is provided for holding the paper strips down on the pins or hooks. The tearing member may be of any suitable form such as a bar having holes 28 for accommodating the pins or hooks and it is mounted on and between a pair of levers 29, each pivotally mounted on a pin 30 set in the inner face of one of the bars 16 below the platen. The forward ends of the levers 29 are turned upwardly at right angles for supporting the tearing member above the platen and their rear ends are connected together by a cross-bar 31 so that they may be moved in unison. For holding the tearing member seated on the platen or the paper, a spring 32 is connected at one end to a depending lug 33 on a lever 29 and at its other end to a pin 35 set in any suitable part of the stand. If desired, a spring may be used on each lever but usually one spring will be found adequate. To raise the tearing member, a foot treadle 36, pivotally mounted on a rod 37 carried by the feet portions of the standards 10 and connected by a rod 38 to the cross-bar 31 connecting the two levers 29, may be depressed by the operator's foot. When the pressure on the treadle is released, the springs 32 return the tearing member to normal position.

All the foregoing parts are old and well known and my invention resides in providing an aligning device of novel construction which is adapted to be mounted on and between the rear ends of the bars 16 of the stand and to be operated by the action of the foot treadle when the tearing member is raised thereby.

In the illustrated embodiment of the invention, there is shown (Figs. 7–9) a plurality of aligning leaves 40 mounted in a leaf support carried by a frame adapted to be loosely supported on the typewriter stand. The frame comprises a pair of side members 43 fastened together midway by a cross-bar 44 and at their forward ends by a metal rod 45. Adjacent their rear ends, the side members are provided each with a bottom edge recess 46 for housing the rod 18 of the typewriter stand and at their forward ends each with a notch 47 for engaging a pin 48 set in the inner face of bar 16. The frame is set loosely on the rod 18 and pins 48 but is made to fit between the bars 16 so that lateral movement of the frame is prevented, and also at the same time any appreciable longitudinal movement of the frame on the rod 18 and pins 48 by the forms of the recesses 46 and notches 47.

The leaf support may be of any suitable form but as shown comprises a pair of end plates 50 fastened together in separated parallel relation by a cross bar 52. The end plates are approximately rectangular with their lower rear corners cut off on a diagonal line 53 and the upper rear edges of the plates may be turned inwardly to form flanges to which the cross-bar 52 may be fastened. The leaf support is pivotally mounted at its upper forward corners within the frame on pins 54 set in the side bars 43 and is held in horizontal position by gravity against pin stops 55, also set in said side bars, which are engaged by the oblique portions 53 of the two end plates. The leaf support may, however, be turned upwardly on the pivot pins 54 in a manner and for a purpose to be hereinafter described.

Within the support is mounted a plurality of aligning leaves 40, spaced apart to permit the free passage of a strip of paper between each two adjacent leaves. The leaves are pivotally mounted adjacent their bottom edges in the end plates 50 of the support and means is provided for turning them in unison forward and back to perform the aligning operation.

Each leaf 40 (Fig. 4) is of rectangular form and is provided on each end at or adjacent its bottom edge with an ear 60, the two ears being adapted to engage holes 61 in the end plates 50 of the leaf support. The leaves are mounted in upright position and are pivotally movable between pin stops 62 and 63 set in said end plates in position to be engaged by the forward leaf or the rearward leaf respectively for limiting the movement of the leaves in a forward or a rearward direction.

At their bottom edges the spacing of the leaves is regulated by the distance between the holes 61 which is fixed but any suitable means may be provided for holding the top portions of the leaves in spaced relation so long as that means does not interfere with the relative movement of the leaves one to another when turned pivotally en masse. One means of accomplishing this result is illustrated in Figures 4 and 5 and consists in bending the upper corners 65 of all the leaves equally and at an angle which will give the desired spacing. In Fig. 6 another method is shown consisting in mounting U-shaped spring clips 66 on the upper edges of alternate leaves, the thickness of the material from

which the clips are made determining the spacing.

In order that the top edge of each leaf may project a slight distance above the top edge of the leaf immediately forward of it, the pivotal holes **61** are arranged preferably on lines which curve upwardly in a rearward direction. This insures the separation of the different strips of paper forwardly of the aligning device and permits each strip to be aligned by its particular leaf free from interference from other strips.

Normally, the leaves **40** are held in a retracted position with the rear leaf in engagement with the stops **63** by pressure exerting means in engagement with the foremost leaf. One form of this means comprises a rod **70** slidably mounted in the cross-bar **44** which has affixed to its rear end a slotted block **71** carrying a roll **72**. Midway, the rod **70** is bent to form a coil **73** and a helical spring **74** is fastened at one end to said coil and at its other end to the cross-bar **44**. Since the spring is under tension at all times it tends to force the rod rearwardly and to push the aligning leaves in a rearward direction into the retracted position shown in Figure 7 in which the rearmost leaf engages the stops **63**. Fastened to the bottom of the rearmost leaf is an arm **75** to the end of which is secured a spring **76** which is attached at its other end to the cross-bar **52**. This spring is also under tension and tends to throw the leaves forwardly against the stop **62** into the position shown in Figure 8 but being weaker than the spring **74** it has no effect so long as that spring is operative.

For controlling the operation of the aligning leaves through the foot treadle **36** which raises the tearing member **26**, a bell crank lever **78** is pivotally mounted on a depressed portion of the cross-bar **45** and the forward end of the rod **70** is connected to the rearward arm of said lever. The forward arm of the bell crank lever is bifurcated in order to straddle the foot treadle rod **38** and the bell crank lever is so positioned that when the treadle is in raised position and the tearing member is in holding position, the bifurcated arm of the bell crank lever is in engagement with the cross-bar **31** connecting the two levers **29** on which the tearing member is mounted. A roll **79** may be mounted on the cross-bar **31** for projecting in between the bifurcations of the forward arm of the bell crank lever to hold same against lateral movement and the bell crank lever may be locked against lateral movement on the cross rod **45** between a pair of washers **80**. The foremost aligning leaf **40**, which receives the thrust of the roll **72**, may be provided with a reinforcing strip **82** to prevent any bending of that leaf in the center under the pressure exerted through the rod **70**.

For guiding the paper strips in their passage to the typewriter, a pair of depending guides **83** having their upper ends in the form of hooks are hung on the cross-bar **44** and are fastened in any adjusted position longitudinally said bar by thumb screws **84**. The end of each guide is bent into a horizontal position to extend rearwardly under the aligning leaf support for guiding the paper strips on their upward travel to the aligning device.

The leaf support which is pivotally mounted in the pins **54** may, to facilitate threading the paper strips through the aligning leaves, be turned through an arc of ninety degrees from the position shown in Figure 8 to that in Figure 9, and to hold it in the latter position, it may be provided with a hook **85**, loosely mounted on a pin **86** set in the inner face of one of the end plates **50** of the leaf support, and adapted to hook under the cross-bar **44**.

In the use of my device, the frame and aligning mechanism carried thereby as shown in Figure 3 are placed in position on the rear portion of the typewriter stand as shown in Figure 1. The leaf support is then turned upright and locked by the hook **85** and is ready for threading the continuous paper strips through the block of aligning leaves.

In the use of devices of this kind, the supply of paper may be placed upon the floor or upon a suitable support underneath the rear portion of the stand, in position to be drawn upwardly through the aligning device and then horizontally over the platen and under the typewriter. In Figure 1, the paper strips **90** are shown as being superposed and folded zigzag in that relation to form what is termed a "flat pack" **91**. The paper strips are perforated or weakened on transverse lines so that they fold readily in those lines to form the pack, and each fold as a rule is printed with a standard form adapted to be filled in with typewriting. It is also customary to provide each of the forms with a pair of filing holes. In the drawing, the flat pack is shown as made up of four superposed strips but a greater or a lesser number may be used. Stationery of roll form may be used if desired.

In preparing the machine for operation, the four strips are passed through any four adjacent spaces **92** between the aligning leaves and the forward ends of the superposed strips are then pulled over the platen, the tearing member raised either by hand or by operating the foot treadle, and the ends of the strips are arranged on the front edge of the platen with the hooks **24** in the filing holes. The tearing bar is dropped to hold the strips on the hooks. The leaf support is then unhooked and turned back into normal horizontal position during which movement the roll **72** carried by the rod **70** engages the forward aligning leaf and forces all the leaves into the position shown in Figure 7 thereby straightening and aligning all the strips of paper.

After a form has been used, the operator raises the tearing member by the operation of the foot treadle which releases the pressure of the roll **72** on the aligning leaves and permits the spring **76** to throw them forwardly. The paper strips are then pulled forwardly to bring a new form under the typewriter and are locked on the hooks **24**, after which the tearing member is dropped into holding position by releasing the pressure on the treadle and the used sheets are then torn off. When the tearing member drops, the aligning leaves are pushed rearwardly to straighten and align the paper strips. In this movement the top edges of those leaves in engagement with the strips of paper drag against the strips and tend to pull them rearwardly thereby straightening out the strips into register with each other and this condition is maintained due to the sharp angle in the strips at those edges as shown in Fig. 7. Since the pivotal points of the leaves are arranged on a curve, the top edge of each leaf projects slightly above the top edge of the leaf immediately forward of it as the leaves are turned rearwardly so that the strips of paper are thereby separated when acted upon by said top edges and are prevented from frictionally interfering with each other.

It will be observed that after my device has been

positioned and threaded, the normal operation of the tearing member by the foot treadle operates it so long as the supply of paper lasts.

It is to be understood that my invention is not to be limited to the specific form herein shown and described since it may be embodied in various other forms of construction all within the scope of the following claims.

What I claim is:—

1. In a device of the character described, the combination of a support, a plurality of aligning leaves pivotally mounted in said support in spaced relation permitting a paper strip to travel between each two adjacent leaves from a source of supply, a pair of stops for limiting the pivotal movement of said leaves in both directions, normally operative means for holding said leaves in a retracted position against one of said stops and means for turning said leaves forwardly against the other of said stops when said holding means is released.

2. In a device of the character described, the combination of a support, a plurality of aligning leaves pivotally mounted in said support in spaced relation permitting a paper strip to travel between each two adjacent leaves from a source of supply, a pair of stops adapted to be engaged by the two end leaves for limiting the pivotal movement of said leaves in both directions, normally operative means for holding said leaves in a retracted position against one of said stops, a treadle for releasing said holding means at the will of the operator and means operative for turning said leaves forwardly against the other of said stops when said holding means is released.

3. In a device of the character described, the combination of a support, a plurality of aligning leaves pivotally mounted in said support in spaced relation permitting a paper strip to travel between each two adjacent leaves from a source of supply, a pair of stops for limiting the pivotal movement of said leaves as a whole in both directions, normally operative means for holding said leaves in one position against one of said stops and a spring for turning said leaves against the other of said stops when said holding means is released.

4. In a device of the character described, the combination of a pivotally mounted support, a plurality of aligning leaves pivotally mounted in said support in spaced relation permitting a paper strip to travel between each two adjacent leaves from a source of supply, a pair of stops for limiting the pivotal movement of said leaves as a whole in both directions, normally operative means for holding said leaves in one position against one of said stops and means for turning said leaves against the other of said stops when said holding means is released.

5. In a device of the character described, the combination of a support, a plurality of aligning leaves pivotally mounted in said support in spaced relation permitting a paper strip to travel between each two adjacent leaves from a source of supply, a pair of stops for limiting the pivotal movement of said leaves as a whole in both directions, normally operative spring pressed means for holding said leaves in one position against one of said stops and a spring for turning said leaves against the other of said stops when said holding means is released, said last-mentioned spring being weaker than said first-mentioned spring.

6. In a device of the character described, the combination of a plurality of aligning leaves mounted pivotally for movement in a limited arc and spaced apart to permit a paper strip to travel freely between each two adjacent leaves from a source of supply, a pair of stops for limiting the pivotal movement of said leaves in both directions, means normally operative for holding said leaves against one of said stops in approximately parallel relation to the path of said strips from the source of supply to said leaves and means for throwing said leaves against the other of said stops and in an inclined relation to said path whenever said holding means is released in order to permit said strips to be drawn forwardly.

7. In a device of the character described, the combination of a support, a series of aligning leaves pivotally mounted in said support adjacent their bottom edges and in spaced relation, a pair of stops adapted to be engaged by the two end leaves for limiting the pivotal movement of said leaves in both directions, spring pressed means normally engaging the forward leaf for holding said leaves in a retracted position, a spring connected to the rearmost of said leaves, said spring being weaker than said holding means, and treadle operated means for withdrawing said holding means to permit said spring to throw said leaves forwardly for permitting strips of paper to be drawn freely through said aligning leaves, said holding means being adapted when the pressure on said treadle is released to throw said leaves to a retracted position for straightening out and aligning said paper strips.

8. In a device of the character described, the combination of a frame adapted for mounting on a typewriter stand, a support mounted in said frame, a series of aligning leaves pivotally mounted at their bottom edges and in spaced relation in said support, a pair of stops for limiting the pivotal movement of said leaves in both directions, a spring pressed member for normally engaging the forward leaf for holding said leaves in a retracted aligning position, a spring connected to the rearmost of said leaves, said spring being weaker than said holding means, and treadle operated means for withdrawing said holding means to permit said spring to throw said leaves forwardly for permitting strips of paper to be drawn freely through said aligning leaves, said holding means being adapted when the pressure on said treadle is released to throw said leaves to a retracted position for straightening out and aligning said paper strips.

9. In a device of the character described, the combination of a support, a series of aligning leaves pivotally mounted in said support adjacent their bottom edges and in spaced relation, said pivotal points being arranged on curved lines so that each leaf projects a short distance above the adjacent forward leaf, a pair of stops for limiting the pivotal movement of said leaves in both directions, spring pressed means for normally engaging the forward leaf for holding said leaves in a retracted position, a spring connected to the rearmost of said leaves, said spring being weaker than said holding means, and treadle operated means for withdrawing said holding means to permit said spring to throw said leaves forwardly for permitting strips of paper to be drawn freely through said aligning leaves, said holding means being adapted when the pressure on said treadle is released to thrown said leaves to a retracted position for straightening out and aligning said paper strips.

10. The combination with a typewriter stand provided with a horizontal platen and means for holding the forward ends of a plurality of superposed continuous strips of paper overlying said platen, of an aligning device comprising a support, a series of aligning leaves pivotally mounted in said support at their bottom edges and in spaced relation, means for limiting the pivotal movement of said leaves in both directions, means for normally engaging the forward leaf for holding said leaves in a retracted position, a spring connected to the rearmost of said leaves, said spring being weaker than said holding means, and treadle operated means for withdrawing said holding means to permit said spring to throw said leaves forwardly for permitting strips of paper to be drawn freely through said aligning leaves, said holding means being adapted when the pressure on said treadle is released to throw said leaves to a retracted position for straightening out and aligning said paper strips.

11. The combination with a typewriter stand having a platen, provided with means for holding the forward ends of a plurality of superposed continuous strips of paper led over said platen from a supply below the same, a bar for holding said paper on said holding means and treadle operated means for raising said bar to permit said paper strips to be drawn forwardly, of an aligning device for straightening out and aligning said strips of paper on said platen comprising a leaf support mounted on said stand behind said platen, a series of leaves mounted upright at their bottom edges for pivotal movement in a limited arc, said leaves being spaced apart permitting a strip of paper to travel upwardly between each two adjacent leaves, means for throwing said leaves forwardly when said holding bar is raised by the operation of said treadle in order to permit said paper strips to be drawn forwardly between said leaves and means whereby when the pressure on said treadle is released permitting said bar to return to paper holding position said aligning leaves are turned rearwardly to straighten and align said paper strips over said platen, said means being adapted to hold said leaves in retracted position so long as said treadle remains in a raised position.

12. The combination with a typewriter stand having a platen provided with a pair of pins for holding the forward ends of a plurality of superposed continuous strips of paper led over said platen from a supply below the same, a bar for holding the ends of said strips on said pins and treadle operated means for raising said bar to permit said paper strips to be drawn forwardly, of an aligning device for straightening out and aligning said strips of paper on said platen comprising a leaf support mounted on said stand behind said platen, a series of leaves mounted upright at their bottom edges in said support for pivotal movement in a limited arc, said leaves being spaced apart permitting a strip of paper to travel upwardly between each two adjacent leaves, means for throwing said leaves forwardly when said holding bar is raised by the operation of said treadle in order to permit said paper strips to be drawn forwardly between said leaves and means whereby when the pressure on said treadle is released permitting said bar to return to paper holding position said aligning leaves are turned rearwardly whereby the top edges of said leaves drag on said paper strips to straighten them and align them over said platen, said leaves when in a retracted position being adapted to hold said strips in straightened aligned position.

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