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3,035,679

PAPER ALIGNMENT MECHANISM FOR TYPEWRITERS OR THE LIKE

Filed June 27, 1960

2 Sheets-Sheet 1

FIG. 1

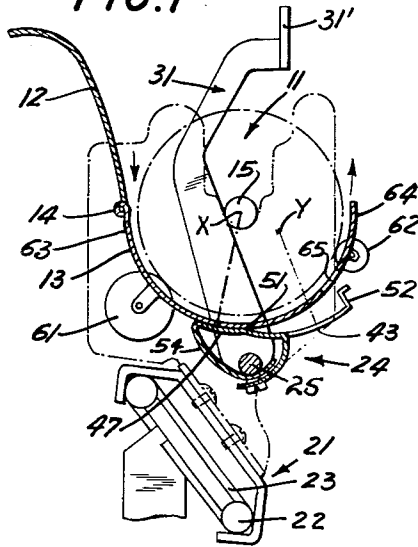


FIG. 2

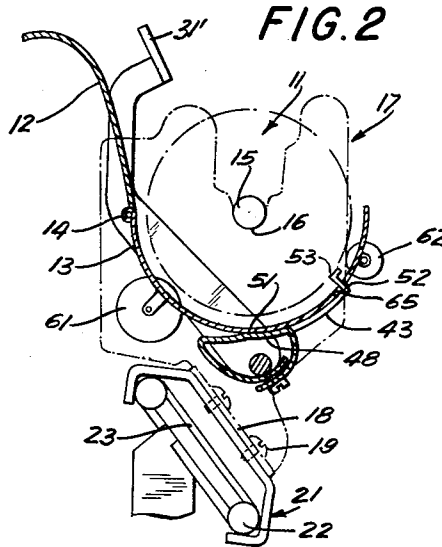


FIG. 3

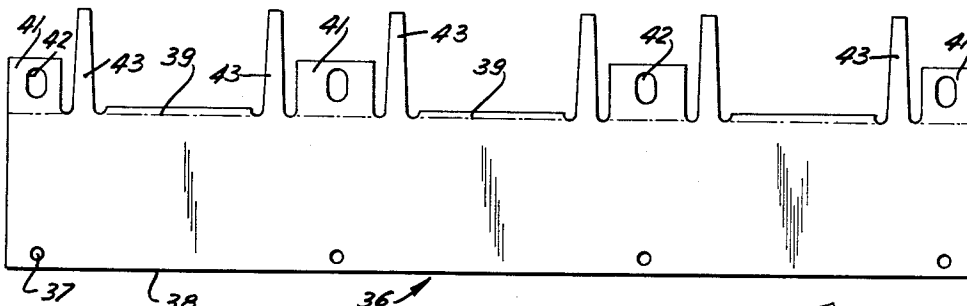


FIG. 6

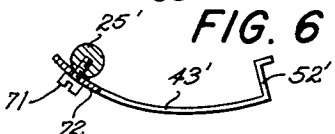


FIG. 4

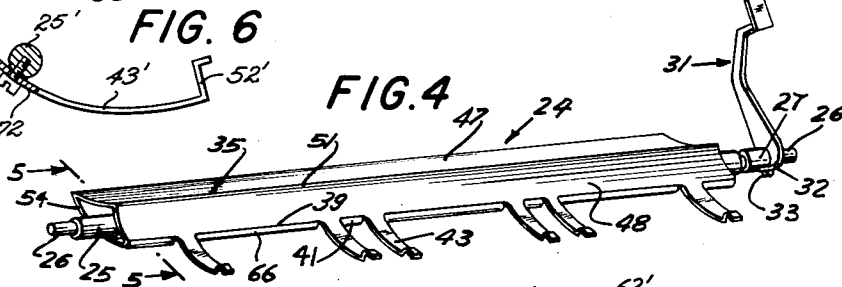


FIG. 5

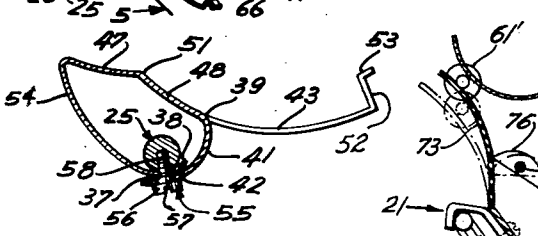
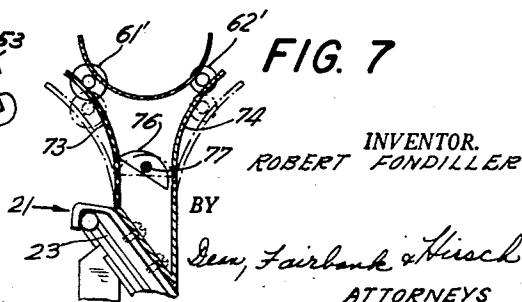


FIG. 7



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3,035,679 PAPER ALIGNMENT MECHANISM FOR TYPE- WRITERS OR THE LIKE

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4 Claims. (Cl. 197-138)

This invention relates to the art of paper alignment and more particularly to a device for facilitating the alignment of the paper in typewriters.

As conducive to an understanding of the invention, it is noted that when one or more sheets of paper and interposed carbons are inserted between the platen and paper pan of a typewriter, and after the paper pan is moved downwardly from its normal or clamping position in which pressure rollers associated with the platen apply pressure against the paper to hold it firmly against the platen, attempts are made manually to align the paper so that the lines of typing thereon will be parallel to the top and bottom thereof, and no positive guides are provided for the paper for this purpose, the operation is time-consuming and its accuracy is based solely on the skill of the typist.

It is accordingly among the objects of the invention to provide a paper alignment mechanism which is simple in construction, having but few parts that may readily be fabricated at low cost and readily assembled in conjunction with any conventional typewriter, with but slight modification thereof, which is not likely to become deranged even after long use and may readily be operated to provide a positive abutment for the paper inserted between the platen and paper pan of the typewriter to permit rapid alignment of the paper, even by an unskilled typist, to insure that the lines of typing thereon will be parallel to the top and bottom of the paper.

Another object of the invention is to provide a paper alignment mechanism of the above type that will greatly simplify the mechanism for moving the paper pan to and from clamping position with respect to the platen.

According to the invention, these objects are accomplished by the arrangement and combination of elements hereinafter described and more particularly recited in the claims.

In the accompanying drawings in which is shown one or more of various possible embodiments of the several features of the invention,

FIG. 1 is a transverse sectional view showing the alignment mechanism so positioned as to place the paper pan assembly in clamping position,

FIG. 2 is a view similar to FIG. 1 showing the alignment mechanism so positioned as to permit the paper pan assembly to drop by gravity into paper release position,

FIG. 3 is a plan view of a blank from which the alignment mechanism is formed,

FIG. 4 is a perspective view of the alignment mechanism,

FIG. 5 is a sectional view taken along line 5-5 of FIG. 4,

FIG. 6 is a detail sectional view of another embodiment of the alignment mechanism,

FIG. 7 is a sectional view of another embodiment of the paper release mechanism,

FIG. 8 is a view similar to FIG. 2, but on an enlarged scale, of another embodiment of the alignment mechanism, and

FIG. 9 is a perspective view with parts broken away of a paper guide.

Referring now to the drawings, the paper alignment mechanism is illustratively shown incorporated in a typewriter of any conventional type, only the parts of which essential to an understanding of the invention being shown.

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As shown in FIG. 1, the platen 11 of the typewriter has associated therewith the conventional paper table 12 and paper pan 13, the upper edge of which may be connected to the lower edge of the paper table in conventional manner as at 14.

The platen 11 has the usual shaft 15 extending axially from each end, which rests in a recess 16 in associated carriage end plates 17, each of which has a lateral flange 18 at its lower edge secured as by screws 19 to the conventional carriage base 21 of the typewriter, said carriage base being slidably mounted by suitable ball bearings 22, for example, on carriage rails or support 23, rigid with the typewriter base proper.

Extending beneath the platen parallel to the axis thereof is the paper alignment mechanism 24, which comprises a paper release control shaft 25, which, as shown in FIG. 4, has reduced diameter ends 26 which extend through corresponding openings in the end plates 17 rotatably to mount said shaft.

To rotate said shaft 25, a lever 31 is desirably provided, having an opening near its lower end through which the shaft 25 extends, and having a lateral flange 32 at said lower end which is secured to shaft 25 near the end 27 thereof as by screw 33.

Mounted on the shaft 25 is an elongated hollow member 35 shown in FIG. 4, desirably formed from a relatively thin sheet metal blank 36 shown in FIG. 3, of thickness less than that of the paper pan so that it is more flexible than the latter.

As shown in FIG. 3, the blank 36 is substantially rectangular, having a plurality of spaced circular openings 37 adjacent its edge 38. The opposite edge 39 of the blank 36 has a plurality of spaced substantially rectangular tabs 41 extending outwardly therefrom, each with an elongated slot 42 therethrough transversely aligned with the respective openings 37 and of greater width than the diameter of said openings.

Also extending outwardly from the edge 39 of the blank 36 are a plurality of pairs of relatively narrow fingers 43, positioned respectively between adjacent pairs of tabs 41, three pairs of fingers 43 illustratively being provided.

The elongated hollow member 35 formed from blank 36 has its top surface defined by two elongated portions 47, 48, each arcuate in cross section and having a common junction 51 extending longitudinally of the elongated member. Each of the portions 47, 48 is part of a circle desirably having the same radius, but with the origin of the radius forming the arcuate portion 47 being displaced from the origin of the radius forming the arcuate portion 48 so that arcuate portion 48 is closer to shaft 25 than arcuate portion 47, permitting the paper pan 13 to drop, affording space for paper insertion between the paper pan 13 and the platen 11.

As shown in FIG. 5, the fingers 43 extend outwardly as a continuation of arcuate portion 48 and along substantially the same arc, and the end of each finger is bent upwardly at substantially right angles thereto to define an abutment 52 which has a lateral outstanding lip 53 at its upper end.

The tabs 41 along the edge 39 of the arcuate portion 48 are reversely bent as shown at 66, and the portion of the blank 36 adjacent the edge 38 is reversely bent as at 54 so that the tabs 41 extend outwardly of the edge 38, with openings 37 and the slots 42 in alignment.

As is clearly shown in FIG. 5, the elongated member 35 is secured to the shaft 25 by screws 55, each having a head 56 with a reduced portion 57 of diameter slightly less than the maximum width of the associated slot 42 and of thickness greater than the openings 37, and greater than that of said tab 41, and an axially threaded stem 58 of diameter but slightly less than that

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of the associated opening 37. Thus, when the screws 55 are inserted into correspondingly threaded openings in shaft 25 which extends through the hollow member 35, and tightened, the free edge 38 of member 35 will be tightly held against the shaft 25 by reduced portion 57 of the screw, and the tabs 41 will be free to slide with respect to said reduced portion 57.

As shown in FIGS. 1 and 2, the alignment mechanism is positioned beneath the paper pan 13, which has conventional rows of feed rolls 61, 62 adjacent its longitudinal edges 63, 64. The paper pan 13 also has a plurality of slots 65 to accommodate the abutments 52 of the fingers 43.

In the normal position of the alignment mechanism as shown in FIG. 1, with the lever 31 in its forward position against the shaft 15 of the platen, which defines a stop for the lever, the origin X of the radius forming the arcuate portion 47 illustratively will be aligned with the axis of shaft 15 of the platen, and the origin Y of the radius forming the arcuate portion 48 will be to the right and below the axis of shaft 15. The arcuate portion 47 will be engaged by the paper pan and will be under compression. As a result, the paper pan will be urged upwardly with the feed rolls 61, 62 against the platen, and the portions 54 and 41 of the elongated member 35 will be deflected downwardly under compression. This would normally tend to rotate the shaft 25 in a counterclockwise direction from the position shown in FIG. 1. However, as the paper pan 13 is seated against arcuate portion 47 and as the junction 51 is against the arcuate paper pan, movement of the shaft 25 and of the lever 31 away from shaft 15 will be restrained due to the fact that the paper pan is more rigid than the blank 36 from which the elongated member 35 is formed, and hence the abutment of junction 51 against the paper pan will restrain rotation of the shaft 25, regardless of the fact that the portions 54 and 41 of the elongated member 36 are under compression.

To move the feed rolls 61, 62 away from the platen, it is merely necessary to press the finger portion 31' of lever 31 backwards to rotate the lever in a counterclockwise direction. Due to the leverage of the force exerted by the lever and the resistance of paper pan 13, the junction 51, as it tends to move in an arc, will be forced downwardly, compressing the elongated member 35, the tabs 41 sliding with respect to the screws 55 to permit such movement, until the arcuate portion 48 engages the paper pan as shown in FIG. 2, permitting the tabs 41 to slide back to the expanded position of elongated member 35.

As the shaft 25 is rotated by the lever 31 to move the arcuate portion 47 away from the paper pan 13 to the position shown in FIG. 2, the paper pan 13 will move downwardly by gravity until it is seated on the arcuate portion 48. In this position, the feed rolls 61, 62 will be spaced from the platen 11, and such rotation of the elongated hollow member 35 will cause the abutments 52 carried by fingers 43 to move upwardly through the slots 65 in the paper pan 13, as shown. With the paper pan 13 seated on arcuate portion 48, the alignment mechanism 35 will remain in such position due to the weight of such paper pan 13.

Thereupon, the sheets of paper to be typed are inserted in conventional manner between the paper pan 13 and the platen 11 until the leading edge of the paper rests against the abutments 52 which provide a straight edge for the paper. In such position, the paper will positively be aligned, so that the rows of typing thereon will be parallel to the top and bottom of the paper.

Thereupon, after the paper is so aligned, the lever 31 is pivoted in a clockwise direction to rotate shaft 25 to move the abutments 52 out of the slots 65 and to force the arcuate portion 47 against the paper pan 13 so that the latter will be lifted to the position shown in FIG. 1 in which the feed rolls 61, 62 will urge the paper against

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the platen 13 to permit movement of the paper by rotation of the platen in conventional manner.

If for any reason it should be desired to again release the paper after it has once been aligned and after the leading edge thereof has passed the abutments 52, it may be accomplished in the same manner as previously described. However, since the paper has passed over the slots 65, the abutments 52 will not be able to pass through such slots, but the lips 53 thereof will press against the paper.

As the fingers 43 are relatively narrow and the material from which they are formed is relatively thin, the fingers will yield readily so that the lips 53 will exert very little pressure against the paper to avoid marring the paper as the platen is turned, or causing impressions thereon due to the use of carbon paper. Furthermore, since the lips are relatively wide, they will distribute their light pressure against the paper over a wide area, further minimizing any marking thereof.

In some applications it may be desirable to utilize the conventional paper release mechanism of the typewriter and add only the paper alignment mechanism.

To this end, as shown in FIG. 6, the shaft 25', which preferably is the paper release shaft, has secured thereto, as by screws 71, an elongated strip 72, which has a plurality of curved elongated fingers 43' extending from one edge thereof, which are identical to the fingers 43 shown in FIGS. 1 to 5.

In the operation of the embodiment shown in FIG. 6, after the paper pan has been lowered to release the paper by the conventional mechanism, the shaft 25' is rotated to move the abutments 52' upwardly through the slots in the paper pan to permit alignment of the paper in the manner previously described.

If desired, instead of utilizing the paper release mechanism shown in FIGS. 1 to 5, or conventional paper release mechanism, the embodiment shown in FIG. 7 may be employed either alone or in conjunction with the paper alignment mechanism of FIG. 6.

As shown in FIG. 7, the paper release mechanism comprises a pair of spring loaded arms 73 and 74, which may, for example, form the sides of a substantially U-shaped member of spring steel which is secured to the carriage base 21 of the typewriter.

The arms 73, 74 are adapted operatively to react against the shafts carrying the feed rolls 61', 62', normally to urge the rolls upwardly to retain the sheets of paper against the platen of the typewriter.

To release the paper, a cam 76 is provided secured to a shaft 77, which may be rotated in any suitable manner. The cam normally is in position to exert no force against the arms 73, 74 which resiliently react against the feed rolls to retain the latter in paper feed position. When the cam 76 is rotated to the position shown in broken lines in FIG. 7, the arms 73, 74 will be spread apart, thereby permitting, in the illustrative embodiment shown, the paper pan and the feed rolls carried thereby to drop by gravity to release the paper.

In the embodiment shown in FIGS. 8 and 9, parts corresponding to those in FIGS. 1 to 5 have the same reference numbers. This embodiment is identical to that of FIGS. 1 to 5 except for the addition of the paper guide member 90, the function of which will be hereinafter described.

As shown in FIGS. 8 and 9, the guide member 90 comprises an elongated strip 91 of substantially rigid material defining a ledge extending at right angles from a depending portion 92, said ledge serving as a backing member for the paper when the latter has passed under, around and over the platen to facilitate erasures by the typist or writing on the paper.

The depending portion 92 has a plurality of spaced fingers 93 spaced therealong and depending from its lower edge, said fingers being curved to correspond generally

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to the curvature of the platen 11, each of the fingers 93 having a slot 94 at its free end.

The guide member 90 may be supported in any suitable manner, for example, on the paper table 12, to be retained in substantially fixed position with the curved fingers 93 extending between the longitudinally spaced feed rolls 61, 62, with the abutments 52 extending through the respective slots 94, as shown in FIG. 8.

Thus, when paper is inserted between the guide member 90 and the paper table 12 and paper pan 13, the leading edges of the sheets of paper will be dependably guided against the abutments 52 for alignment in the manner previously described.

The constructions above described, in addition to providing simple yet dependable means for providing accurate alignment of the paper, also greatly simplifies the mechanism for effecting movement of the paper pan and feed rolls toward and away from the platen to permit ready movement of the paper for alignment either by conventional methods or by the use of the alignment mechanism herein described.

It is within the scope of the invention to utilize other means to align the paper. Thus, a straight edge may be provided to be moved into the path of movement of the paper at any one of a number of points of its travel around the platen. It is only essential that when the paper is aligned it be so located that it has passed at least one set, but preferably both sets, of pressure rolls, so that when the paper pan carrying the latter is moved to typing position the paper will be firmly clamped against the platen for subsequent movement of the paper upon rotation of the platen.

As many changes could be made in the above constructions and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desired to secure by Letters Patent of the United States is:

1. In a typewriter or similar device having a platen, a paper pan, means to retain a sheet of paper positioned between the paper pan and the platen against the latter for movement of such paper by rotation of the platen, and means to release said retaining means to permit movement of the paper independently of the platen, paper alignment mechanism comprising an abutment movable into the path of the leading edge of the paper to effect alignment of the inserted paper against the abutment, said paper pan being arcuate in cross section and having at least one aperture therethrough, said alignment mechanism comprising an elongated member of resilient sheet material extending beneath said paper pan parallel thereto, and having a top surface with a first and second elon-

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gated portion, each arcuate in cross section and having a common junction extending longitudinally of said hollow member, a shaft extending beneath the top surface of said elongated member and parallel thereto, means to secure said elongated member to said shaft, finger means extending outwardly from the free edge of the second of said portions, the free end of said finger means defining said abutment, means to rotate said shaft in one direction to move the first of said portions to a position beneath said paper pan and in engagement therewith, resiliently to urge the paper pan and associated feed rolls to retain the paper against the platen, and in the opposite direction to move the first of said portions away from the paper pan and the second of said portions to a position beneath the paper pan to support the latter spaced from the platen to permit movement of such paper independently of the platen, and to move said abutment into the aperture in the paper pan into the path of movement of the leading edge of the paper, said common junction between said portions defining a further locking conformation releasably to retain said elongated member in either of such two positions.

2. The combination set forth in claim 1 in which the free end of said finger means is bent at substantially right angles thereto to define said abutment and the end of said abutment has a lip extending laterally outward therefrom.

3. The combination set forth in claim 1 in which each of said two arcuate portions is part of a circle having substantially the same radius, the origin of the radius of the first arcuate portion being on one side of the axis of said platen and the origin of the radius of the second arcuate portion being on the other side of the axis of the platen and below the origin of the radius of the first arcuate portion.

4. In a typewriter or the like having a platen and a paper pan, paper release mechanism comprising a resilient member positioned beneath said platen and movable between two operating positions, said member having two portions, one of said portions in one position of said resilient member reacting against said paper pan to urge the latter and associated feed rolls upwardly toward the platen to retain a sheet of paper positioned between the paper pan and the platen against the latter for movement of such paper by rotation of said platen, said portion in the second position of said resilient member being moved downwardly from said platen with said second portion being moved upwardly to receive said paper pan and to retain the paper pan and feed rolls spaced from said platen for movement of said paper independently of said platen.

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