June 20, 1939. N. DODDS 2,162,706

COPY HOLDER

Original Filed Sept. 22, 1934 2 Sheets-Sheet 1

Fig. 1.

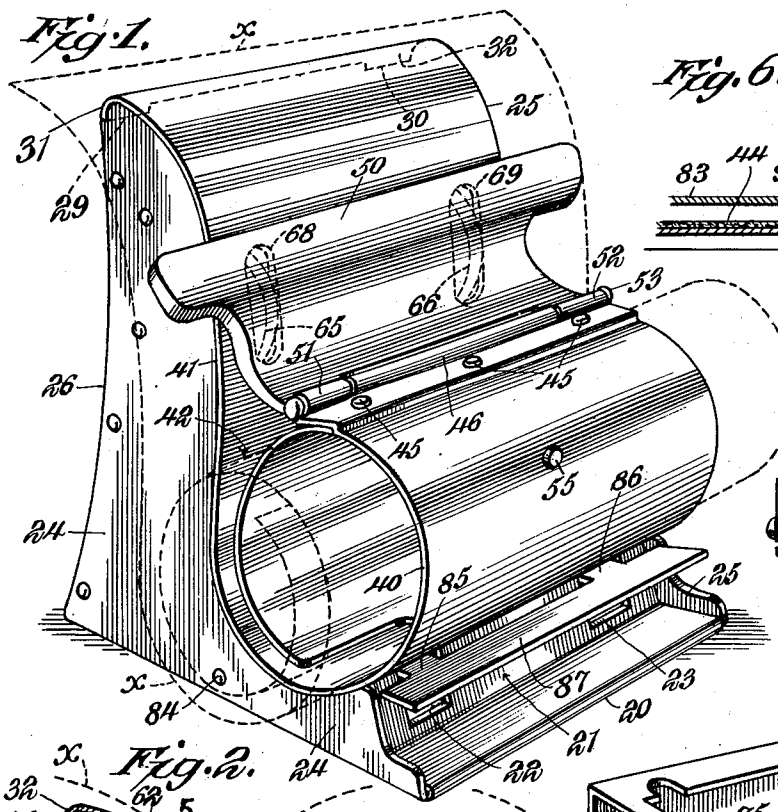



Fig. 6.

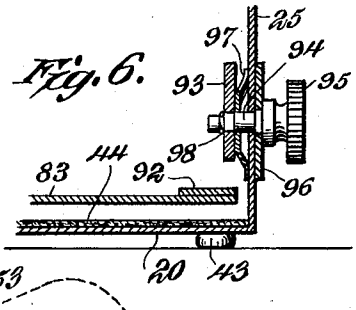



Fig. 7.

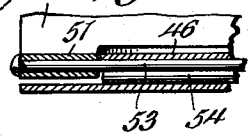
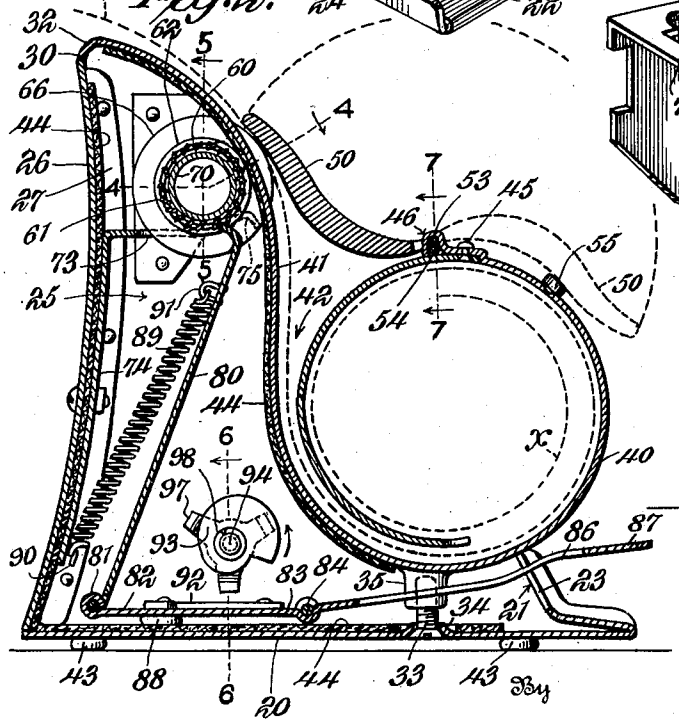


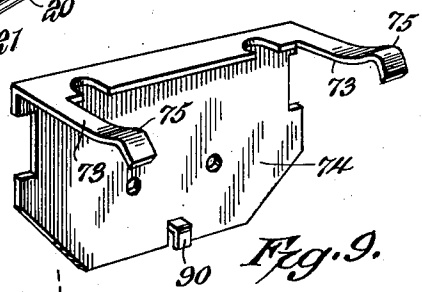

Fig. 8.

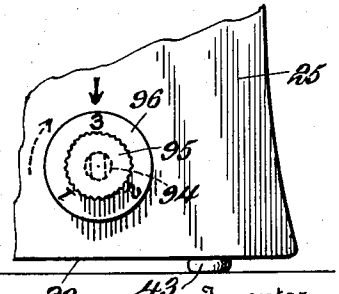
Fig. 2.




By

Fig. 9.




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COPY HOLDER

Original Filed Sept. 22, 1934 2 Sheets-Sheet 2

Fig. 3.

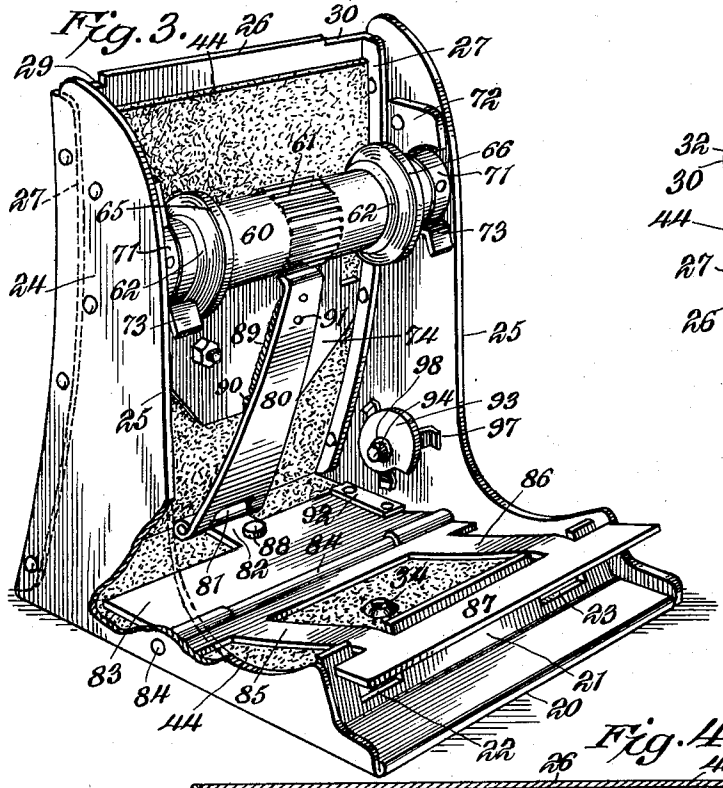



Fig. 10.

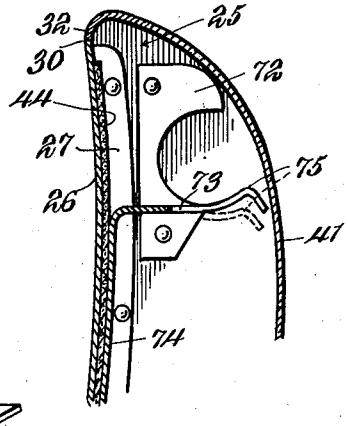



Fig. 4.

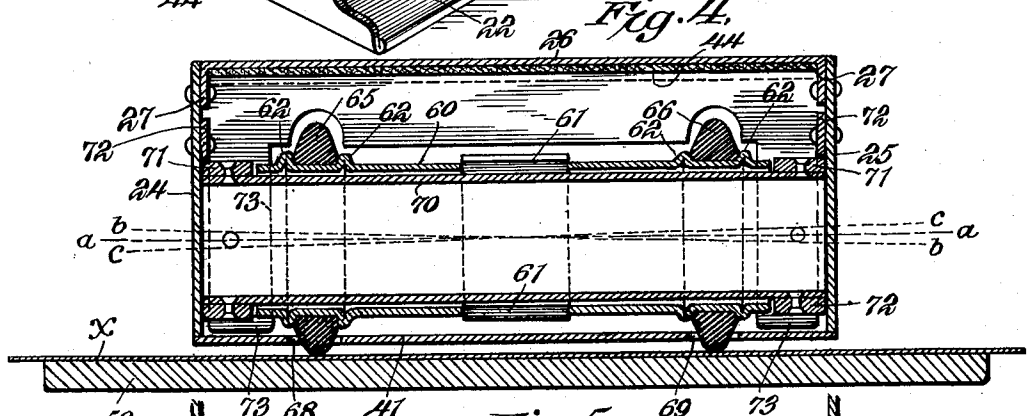
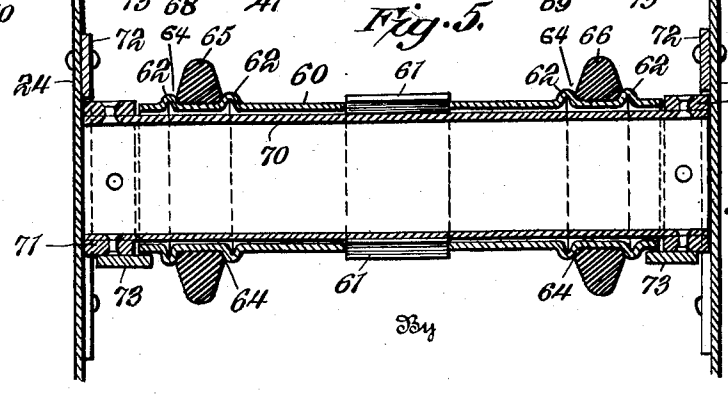



Fig. 5.




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Patented June 20, 1939 2,162,706

# UNITED STATES PATENT OFFICE

2,162,706

## COPY HOLDER

Nugent Dodds, Washington, D. C.

Application September 22, 1934, Serial No. 745,134
Renewed September 10, 1938

11 Claims. (Cl. 120—32)

This invention relates to copyholders, more particularly to the copyholder of my Patent No. 1,939,671, granted December 19, 1933, for holding a sheet of manuscript, or typewriting, or printed matter to be copied and for moving the sheet intermittently, a line at a time, so as to bring the lines successively to a predetermined level or position of vision for the copyist.

The general object of the present invention is to improve the construction shown in said patent, and the improvements constituting the invention are illustrated in the accompanying drawings and will be readily understood from the following detailed description in conjunction with said drawings, wherein—

Fig. 1 is a perspective view;

Fig. 2 is a central vertical sectional view;

Fig. 3 is a perspective view similar to Fig. 1, but with the front portion of the copyholder removed to shown the mechanism within;

Figs. 4 and 5 are sectional views on a somewhat larger scale,

Fig. 4 being a horizontal section on line 4—4 of Fig. 2 and

Fig. 5 being a vertical section on line 5—5 of Fig. 2;

Figs. 6 and 7 are detail sectional views on lines 6—6 and 7—7 respectively of Fig. 2;

Fig. 8 is a detail perspective view of one of the parts;

Fig. 9 is a fragmentary view in elevation from the right of Fig. 6; and

Fig. 10 is a detail view in vertical section.

The casing which encloses working parts of the feeding mechanism is made of sheet metal, preferably sheet steel. Its construction includes a bottom wall 20 having across its forward edge an upright but rearwardly inclined flange 21 with slots or notches 22 and 23 therein, two side walls 24 and 25, and a back wall 26 having a flange 27 along each side edge thereof, said flanges being secured by rivets to the side walls 24 and 25, respectively. The bottom wall 20 and its upright flange 21 and the side walls 24 and 25, may be integrally formed (as shown in the drawings) from a single blank of sheet steel. The front wall of the casing fits closely against the curved upper edges of the side walls 24 and 25, also against the upper edge of flange 21, and also against the upper edge of back wall 26, the latter edge having therein notches 29, 30 engaged by lugs 31 and 32 respectively on the front wall, whereby the latter is accurately positioned and held in place at its upper end against sidewise shifting in relation to the other walls of the casing. The front wall is detachably secured in place by a screw 33 passing upwardly through a countersunk opening 34 in the bottom wall 20 and engaging a screw-threaded socket in a boss 35 depending from the underside of the front wall. The screw is preferably such that it can be engaged and turned by the edge of a small coin, as screw drivers are frequently unavailable in offices and at other places where copyholders may be used. Removal of the screw 33 releases the front wall and permits removal thereof to afford easy access to the mechanism within the casing.

The front wall of the casing is so shaped as to constitute a hollow or tubular paper retainer 40 and an upright reversely curved paper guiding extension or member 41 of said retainer. The retainer 40 is open at both ends to accommodate paper which may be of a width exceeding that of the retainer (the entire copyholder preferably being relatively narrow) and has an opening 42 lengthwise thereof through which sheets of copy (such as the sheet $x$ shown in dotten lines in Figs. 1 and 2 and in full lines in Fig. 4) may be introduced into and spirally wound within the retainer and then withdrawn or uncoiled therefrom in the process of copying. As the sheet of paper is withdrawn from the retainer through said opening 42 by feeding mechanism hereinafter described, said sheet moves upwardly along and in front of, and is guided by, the extension member 41 which faces toward the front of the copyholder, and the sheet is thus presented and supported in an approximately upright position and in a manner to be readily visible to the copyist.

Four rubber buttons 43 projecting from the under face of the bottom wall 20, one near each corner thereof, constitute noise deadening supports or feet for the apparatus. The inner faces of the front wall, of back wall 26 and of bottom wall 20, are covered by noise deadening material 44, such as sheet felt, secured in place by suitable adhesive or cement.

As shown, the front wall of the casing is made of two pieces of sheet metal (preferably sheet steel) having overlapping edges secured together by rivets 45, the uppermost of said edges being extended beyond the riveted joint and bent to constitute an elongated hinge knuckle 46. 50 is a movable presser member having at its lower edge two spaced hinge knuckles 51 and 52 positioned at opposite ends respectively of the hinge knuckle 46 and in alinement therewith. A hinge pin 53 passes through all three knuckles and is headed at both ends whereby it is secured to and

turns with the presser member 50. Said pin bears against an elongated anti-friction roller or bar 54 freely rotatable within the hinge knuckle 46 (see Figs. 2 and 7). When the hinge pin 53 turns with movement of the member 50, said pin rotates the anti-friction roller or bar 54. Presser member 50 is preferably a drop forging of bronze and is made of sufficient weight, or weighted, so that when it is swung to its closed or active position bridging the opening 42, as shown in Fig. 1 and in full lines in Fig. 2, it engages the sheet $x$ and acts by gravity to press said sheet into gripping and feeding engagement with rubber rings or tires of the paper feeding mechanism. When member 50 is in its said closed or active position, its upper edge also serves as an eye-guide to the lines of writing on sheet $x$, one line after another as the sheet is fed upward step by step, or space by space, by the feeding mechanism about to be described. When it becomes desirable to introduce a sheet of copy into the paper retainer 40 through the opening 42, the movable member 50 is swung on the hinge at its lower edge to its open position in which it does not bridge said opening, as shown in dotted lines in Fig. 2, where it rests against a rubber bumper 55 on the paper retainer 40.

Referring now to the paper feeding mechanism within the casing—60 is the feed roller preferably made from brass tubing and so shaped as to provide around the middle thereof and integral therewith outwardly projecting ratchet teeth 61, constituting in effect a ratchet wheel midway between the ends of the roller. Roller 60 is also shaped to provide around each end thereof a pair of spaced outwardly projecting corrugations or ridges 62 with circumferential grooves or channels 63 and 64, between the pairs of ridges respectively. At their inner edges the ratchet teeth project into the interior of the tubular roller as clearly shown in Figs. 2, 4 and 5.

The feeding of the paper sheet is effected by means of feed rings 65, 66, of rubber or other suitable material, seated in the grooves 63, 64, respectively. Said feed rings or members 65, 66, protrude slightly through suitable apertures 68, 69, respectively, in the part 41 of the front wall of the casing, so that the sheet $x$ is pressed against the peripheries of said protruding portions of the feed rings by the movable member 50 the weight of which is determined so as to exert the proper degree of pressure for efficient operation. As will be obvious, the rubber feed rings 65, 66, can be readily removed when worn and replaced at slight expense. Before being put in place said rings are of less internal diameter than the diameter of the bottom of the grooves 63, 64, and the rings are stretched in putting them in place in said grooves and are retained therein by their own tension.

70 is a tubular axle also preferably made of brass tubing) passing through tubular feed roller 60 and on which the latter is supported midway between its ends by the engagement of the inwardly projecting edges of the ratchet teeth 61 with the outer surface of said axle 70, as shown in Figs. 2, 4 and 5. Beyond the teeth in both directions, the interior diameter of the tubular feed roller 60 is substantially larger than the exterior diameter of the axle 70, thus providing limited clearance such as to permit slight axial tilting of the roller on the axle, the purpose of which will be explained hereafter. Annular metallic bands or collars 71, 71 are riveted on the opposite ends respectively of the axle 70 where said ends project beyond the roller 60, thus securing the roller on the axle so that these two parts may be handled as a unit and as such put in and withdrawn from operative position in the mechanism. At the right hand side of the machine said operative position is determined by a plate 72 and a spring arm 73. Said plate 72 is riveted to the inner face of the upper end of the side wall 25 of the casing and has a concave forward edge which, in conjunction with the spring arm 73, constitute a seat adapted to be engaged by the collar 71 at the right hand end of axle 70, as clearly shown in Figs. 3, 5 and 10. Spring arm 75 extends forward from and is an integral part of a plate 74 which is secured by screw bolts to the inner face of the back wall 26 of the machine casing with the felt lining 44 on said wall interposed.

The operative position of the roller axle unit at the left hand side of the machine is determined by a similar plate 72 riveted to the side wall 26, and a similar spring arm 73 extending forward from said plate 74, these parts also providing a seat adapted to be engaged by the collars 71 at the left hand end of the axle, as shown in Fig. 5.

The feed roller and axle unit is shown in its operative position in Figs. 2–5, with the ends thereof held in their seats in the plates 72, 72, by an upward bend 75 on each of the spring arms 73. Said unit may be readily released and removed from the machine, for replacement of the rubber feed rings 65, 66, or for other purpose, by pressing the spring arms downward in the manner indicated in dotted lines in Fig. 10. In replacing the unit the collars 71, 71 at the ends thereof are engaged with the outer ends of the spring arms 73, 73, respectively and the unit is then forced rearward until both collars pass the upwards bends 75 of the spring arms 73 and find their seats at the rear of said bend.

As most clearly shown in the vertical section, Fig. 5, the width of the spring arms 73 is such that they extend beneath the extreme ends of the tubular roller 60 in a manner to prevent appreciable axial tilting of said roller in relation to the axle 70 in a vertical plane, as such tilting would cause the feed rings to feed the sheet of copy in a slanting or crooked direction. On the other hand, as shown in the horizontal section of Fig. 4, the feed roller 60 is free to shift its position in a horizontal plane so that its axis may be slightly out of alinement with that of the axle 70. For example, let the dotted line $a$—$a$ in said figure represent the axis of axle 70. With the feed roller 60 supported on the axle 70 by the somewhat free engagement with the latter of the inwardly projecting portions of the ratchet teeth on the roller 60, the clearance between the interior surface of the tubular roller 60 and the outer surface of the axle 70 at both sides of said teeth, is such as to permit slight shifting of the axis of the feed roller either in the direction of the dotted line $b$—$b$ or in the direction of the dotted line $c$—$c$, Fig. 4.

The purpose of this freedom of movement of the feed roller 60 in an approximately horizontal plane in relation to the axle, is to enable said roller to automatically shift or accommodate its position to the pressure exerted by the movable member 50 in pressing the sheet of copy $x$ against the two feed rings 65 and 66 of the feed roller and to thereby automatically equalize the grip and feeding action of said two rings upon the sheet of paper.

In other words, the feed-roller is automatically self-positioning by the pressure thereon of the

presser-member to equalize the pressure and grip upon the sheet at the two feed rings and thus insure straight feeding of the sheet and avoid crooked feeding. This is a particularly important feature of the construction of the present invention.

Referring now to the means for rotating the feed roller on its axle and particularly to the illustration thereof in Figs. 2 and 3—80 is a pawl or feed dog preferably made of a flat strip of steel bent rearwardly at its upper end for engagement with the ratchet teeth 61 and at its lower end hinged at 81 to the end of an arm 82 which extends rearwardly from and is part of a rock plate or frame 83. Said frame is supported by and rocks upon a pivot rod or shaft 84 which extends across the interior of the casing with its ends secured in openings in side walls 24 and 25 respectively. Frame 83 has two spaced parallel arms 85 and 86 which extend forwardly through the slots 22 and 23 respectively in the upright flange 21 and are connected by a horizontal space bar or key 87 extending transversely across the front of the machine. The frame 83, its arms 82, 85 and 86 and the space bar 87, are preferably integrally formed from a single piece of sheet steel. A rubber bumper 88 is secured in an opening through frame 83 and by its engagement with the felt lining 44 on the bottom wall 20 of the casing determines the limit of the downward movement of said frame at its rear end as well as the limit of the upward movement of the space key 87. A coiled spring 89, connected at its lower end to a hook 90 on plate 74 and at its upper end to an eyelet 91 at the upper end of pawl 80, exerts its pressure to pull said pawl and the rear end of the rock frame 83 downward until stopped by bumper 88 and to resist upward movement thereof. Depression of the space key 87 by the operator or copyist rocks the frame 83 on its pivot rod 84 to move the rear end thereof and the pawl 80 upward and causing the pawl by its engagement with one of the ratchet teeth 61 to rotate the feed roller. Immediately the operator releases the space key 87 the spring 89 reacts to draw the pawl downward with its point traveling backward over one or more of the ratchet teeth on the feed roller without rotating the latter.

The amount of rocking movement of frame 83 and consequently the length of upward or feed stroke of the pawl 80 and the extent of feed rotation imparted by it to the feed roller for each depression of the space key 87, are determined by the engagement of a plate 92 with the edge of a cam 93. The plate 92 is riveted to the frame 83 and the cam is adapted to be adjusted to different positions. A short shaft 94, Figs. 2, 3 and 6, is rotatably mounted in an opening through side wall 25 of the casing and at its outer end carries a knurled head 95 and a circular dial or disk 96, the latter having a flat sided opening through which a flat sided portion of the shaft engages (see dotted lines in Fig. 9) so that the disk turns with the shaft. Inside the casing the shaft 94 passes through the center of a spring friction member 97 having three radiating arms and then through a flat sided opening in the cam 93 whereby the cam is fixed to the shaft to rotate therewith. A groove around the inner end of the shaft is engaged by a split spring snap ring 98 which locks the cam on the shaft, with the spring friction member 97 somewhat flattened and hence under tension. The friction of member 97 against the inner face of end wall 25 (Fig. 6) and the friction of dial 94 against the outer face of said wall is sufficient to hold the shaft and cam in any position to which they are rotated or set.

The ratchet teeth 61 on the feed roller are preferably so proportioned that one tooth corresponds to movement of the copy sheet one space of typewriting (three sixteenths of an inch), two teeth to two spaces of typewriting and three teeth to three spaces of typewriting. Furthermore the cam 93 and its position on the shaft 94 are preferably such that when the numeral "3" on the dial 96 stands opposite the pointer (which is the position shown in Figs. 3, 6 and 9), each depression of space key 87 will move the copy sheet three spaces; with the dial numeral "2" opposite the pointer each feed movement will be two spaces; and with the dial numeral "1" opposite the pointer each feed movement will be one space. As thus appears, the feeding mechanism may be adjusted or set in accordance with the spacing of the lines on the sheet of copy, to feed the sheet one, two or three spaces for each actuation of the space key.

What is claimed as new is:

1. In a copy holder the combination of a hollow tubular paper retainer for receiving a sheet of copy and having an exit opening extending lengthwise thereof and through which said sheet may be withdrawn; an upwardly disposed extension member facing toward the front of the holder and positioned to guide the sheet upwardly and in front thereof as said sheet is withdrawn from the retainer; a presser member adapted to be swung either to a closed active position in which it bridges the exit slot of the retainer and presses the sheet of copy toward said extension member, or to an open position; and paper feeding means for moving the sheet upward out of the retainer and in front of said extension member, said means including spaced rotatable feed members projecting forwardly through said extension member for engagement with the sheet opposite the engagement thereof by the presser member and said feed members being mounted to be movable in response to the pressure of said presser member to approximately equalize the pressure upon the sheet between each feed member and said presser member.

2. In a copy holder the combination of a hollow tubular paper retainer for receiving a sheet of copy and having an exit opening extending lengthwise thereof and through which said sheet may be withdrawn; an upwardly disposed extension member facing toward the front of the holder and positioned to guide the sheet upwardly and in front thereof as said sheet is withdrawn from the retainer; a presser member adapted to be swung either to a closed active position in which it bridges the exit slot of the retainer and presses the sheet toward said extension member, or to an open position; and paper feeding means for moving the sheet upward out of the retainer and in front of said extension member, said means including a feed roller having spaced feed rings projecting forwardly through said extension member for engagement with the sheet opposite the engagement of the presser member therewith, said feed roller being mounted for movement in response to the pressure of said presser member to approximately equalize the pressure upon the sheet between each feed member and said presser member.

3. In a copy holder the combination of a hol-

low tubular paper retainer for receiving a sheet of copy and having an exit opening extending lengthwise thereof and through which said sheet may be withdrawn; an upwardly disposed extension member facing toward the front of the holder and positioned to guide the sheet upwardly and in front thereof as said sheet is withdrawn from the retainer; a presser member adapted to be swung either to a closed active position in which it bridges the exit slot of the retainer and presses the sheet toward said extension member, or to an open position; and paper feeding means for moving the sheet upward out of the retainer and in front of said extension member, said means including a feed roller having spaced feed rings projecting forwardly through said extension member for engagement with the sheet opposite the engagement of the presser member therewith, said feed roller being mounted for movement in response to the pressure of said presser member to approximately equalize the pressure upon the sheet between each feed member and said presser member, a supporting axle upon which said feed roller is rotatably mounted, and a key and connections therefrom to rotate said roller upon actuation of said key.

4. In a copyholder the combination of a paper retainer for a sheet of copy; a forwardly facing upright member positioned to guide the sheet upwardly and in front thereof as the sheet is withdrawn from said retainer; spaced rotatable feed members projecting through said upright member into engagement with the rear side of said sheet; a presser member engaging the forward side of said sheet and pressing the same into engagement with said feed members; a feed roller carrying said feed members; means movably supporting said feed roller to enable said feed members to automatically position themselves in response to the pressure of said presser member and thereby to approximately equalize the feeding of the paper by each feed member and the cooperating presser member; and key actuated means for rotating said feed roller and its feed members to feed the sheet upon each actuation of the key.

5. In a copyholder the combination of a presser member for engaging one side of a sheet of copy; spaced rotatable feed members engaging the other side of said sheet in opposition to the engagement thereof by said presser member; a feed roller carrying said spaced feed members; an axle on which said feed roller is supported with freedom of movement permitting said feed members to automatically position themselves to equalize the pressure upon the paper between each feed member and the cooperating pressure member; and key actuated means for rotating the feed roller and its feed members to feed the sheet.

6. In a copyholder the combination of a feed roller; an axle on which said roller is rotatable, said axle extending through and at each end projecting from the end of said roller; a casing or framework and a seat thereon for each projecting end of said axle; and a spring arm for holding each end of the axle in its seat.

7. In a copyholder the combination of a casing; a feed roller mounted therein; a rocking frame fulcrumed in the casing near the bottom thereof and of a width approximating the interior width of said casing; a space key carried by and for rocking said frame and located at the front of the copyholder; and a pawl carried by said frame and engaging ratchet teeth carried by said feed roller.

8. In a copyholder the combination of spaced rotatable feed members engaging the rearward side of a sheet of copy; a presser member engaging the forward side of said sheet and pressing the sheet against said feed members; means rotatably supporting said feed members with freedom of movement whereby they are automatically self-positioning in relation to and by the pressure of said cooperating presser member to approximately equalize the pressure upon the sheet between each feed member and the presser member; and key actuated means for importing rotating feed movements to the feed members.

9. In copyholder the combination with a presser means engaging one side of a sheet of copy and paper feeding means engaging the other side of said sheet, said presser means and feeding means being relatively movable to approximately equalize the pressure and grip upon the sheet at different points along the width of said sheet where it is engaged between said presser means and feeding means.

10. In a copyholder, the combination of presser-means for engaging one side of a sheet of copy and paper-feeding means including two rotatable feed members engaging the other side of said sheet opposite the engagement thereof by said presser-means, said presser means and feed members being relatively movable to approximately equalize the pressure and grip thereof upon said sheet.

11. In a copyholder, the combination of presser-means for engaging one side of a sheet of copy and paper-feeding means including two rotatable feed members engaging the other side of said sheet opposite the engagement thereof by said presser-means, said feed members being shiftable in their approximate planes of rotation to approximately equalize the pressure and grip of the presser-means and feed members upon the sheet of copy.

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