Dec. 19, 1933. N. DODDS 1,939,671

COPYHOLDER

Filed Sept. 15, 1932

Fig. 1.

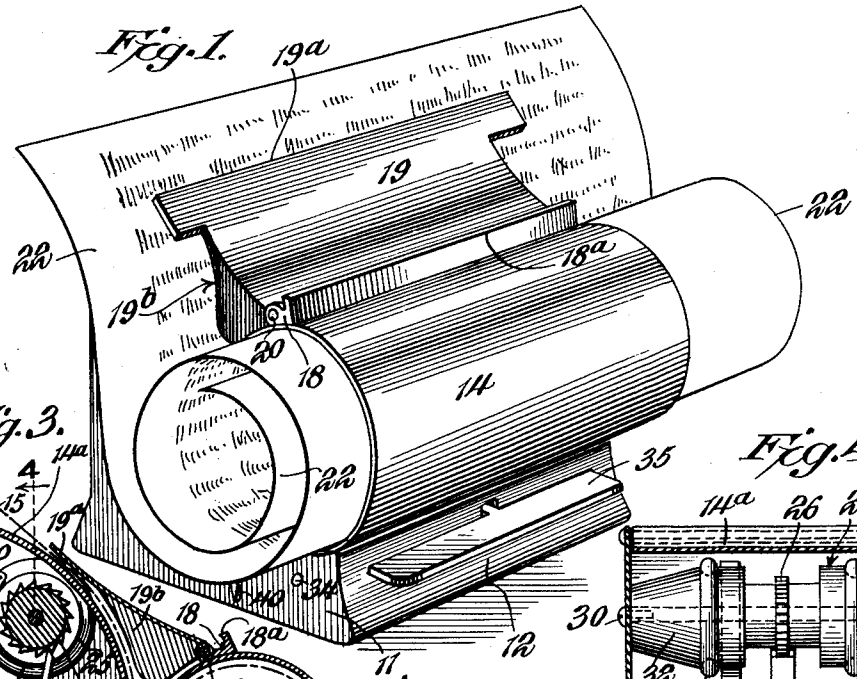


Fig. 3.

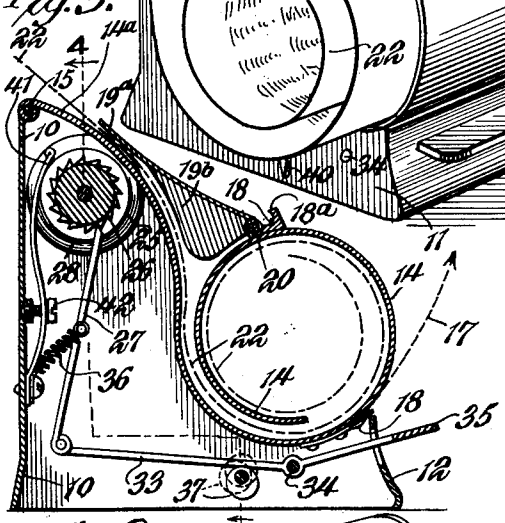


Fig. 4.

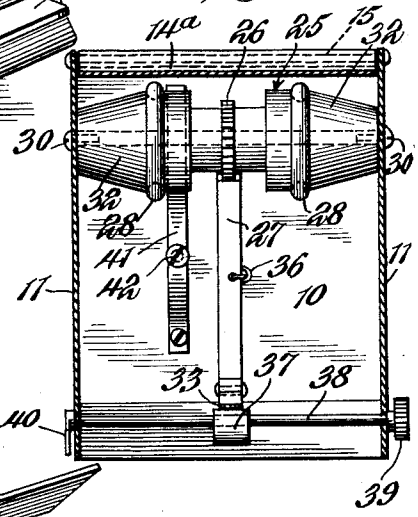


Fig. 2.

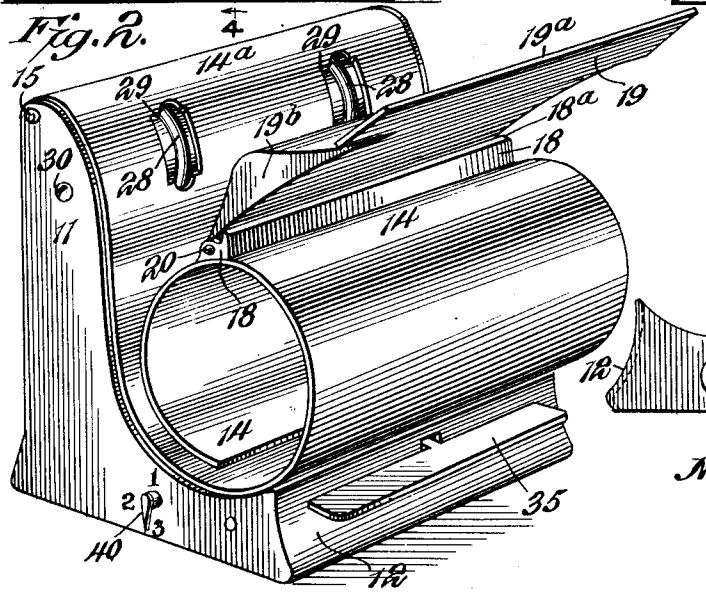
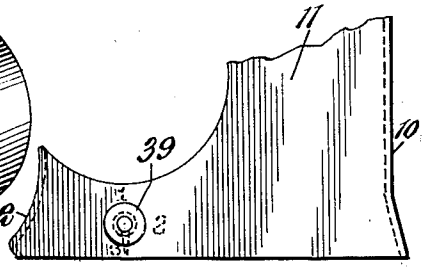


Fig. 5.



INVENTOR,
Nugent Dodds,
BY
Mauro & Lewis,
ATTORNEYS.

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COPYHOLDER

Nugent Dodds, Washington, D. C.

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Serial No. 633,370

18 Claims. (Cl. 120—32)

This invention relates to devices for holding sheets of manuscript or typewriting to be copied, and for moving the sheet intermittently, a line at a time, so as to bring each line successively to the pre-determined level.

The general object of the invention is to produce a device of the class indicated which, while being efficient, easy to operate and affording expeditious service, is relatively small in all its dimensions, composed of few parts, free from complicated mechanism, and hence capable of production at low cost, occupying comparatively little desk-room, requiring no skill for its operation, and not liable to get out of order.

More specifically, the leading objects of the invention are to provide a scroll-shaped copyholder having one or several of the following features:

1. A scroll-shaped holding member such that the side edges of the paper sheet, when inserted therein, may project freely beyond the sides thereof; so that a relatively narrow holder will serve without adjustment for paper of all standard widths.

2. A scroll-shaped member so constructed that a sheet of paper can be inserted therein with great facility and will be retained in position after insertion by frictional contact with the surface of the scroll.

3. A paper holder comprising a scroll-shaped member having a reversely curved extension, combined with frictional paper-feeding wheels preferably located on the concave side of said extension and acting through slots therein.

4. A device combined with said scroll-shaped member which serves as an eye-guide and serves also, by reason either of gravity or spring pressure, as an auxiliary paper-holding and feeding means.

5. A paper feed mechanism, comprising a feed roller having two or more rubber rings or tires that make frictional contact with the paper when the latter is pressed against them by said yielding pressure device, said rings being readily removable and replaceable, and being held in place on the feed roller by their own tension.

6. A paper feed mechanism, such as above described, in which the feed roller has conical ends to facilitate placing the elastic rings in position, so that no skill is required, and but little time, in replacing the rubber rings; the conical part being of a length approximately equal to the circumference of a cross section of the ring, so that the ring can be rolled into position in the groove provided for it without being twisted or distorted.

7. A paper feed mechanism, comprising a feed roller and a pawl and ratchet movement therefor, the teeth of the ratchet wheel being so spaced as to move the feed surface approximately three-sixteenths of an inch when each tooth is successively engaged, twice that distance when every second tooth, and thrice the distance when every third tooth, is engaged—which distances correspond respectively to one, two and three spaces of typewriting, said mechanism comprising also a three-step cam for adjusting the throw of the ratchet feed-dog.

8. A paper feed having an adjusting device of simple construction such as a three-step cam, whereby the length of the feed stroke at each movement of the feed-bar or other actuating member, may be readily varied to feed the paper a distance equal to one, two or three lines, according to whether the writing is single, double or triple spaced.

9. A scroll member so hinged to the top of the supporting frame that it can be swung back to expose the working parts for purpose of adjustment or for removing the feed roller in order to replace the feed rings.

Certain features of the invention, such as the feed roller with its conical ends and removable rubber feed rings, may obviously be used in mechanisms other than copy holders where paper feeding means are employed.

Other objects and features of the invention will be understood from the following description of what is now regarded as the preferred embodiment thereof; reference being had to the accompanying drawing, in which—

Fig. 1 is a perspective view showing the movable eye guide and auxiliary pressure device in their operative positions;

Fig. 2 is a similar view showing said movable parts in the positions they occupy when a sheet of copy is to be introduced or removed;

Fig. 3 is a central vertical section, the plane of section being transverse to the axis of the scroll member;

Fig. 4 is a vertical section on line 4—4, of Fig. 3;

Fig. 5 is a partial side view.

The supporting frame of the copy holder, which also forms part of the housing for the working parts, comprises a back plate 10, two side plates 11, and a relatively narrow front strip 12 extending from one side to the other. The back piece 10 and side pieces 11 can be readily stamped at one operation from a sheet of suit-

ble metal and the sides than bent into position at right angles to the back. The paper holding member is preferably formed of a single piece of sheet metal having a scroll portion or paper retainer 14 and a reversely curved approximately upright extension or copy support 14a.

In other words, there is a hollow cylindrical or tubular portion 14 for receiving a spirally wound sheet of paper or copy, said portion 14 being open at both ends and having an exit slot or opening extending lengthwise thereof and through which said sheet of copy may be drawn or uncoiled; and a portion 14a, extending from said tubular portion 14 in an approximately upright position and providing a surface in front of which the copy moves upwardly and by which said copy is supported in a manner and position to be readily visible. This part will be herein termed "the scroll member". As shown, it serves as a movable front for the case or housing; being hinged at 15, so that it can be lifted bodily as indicated by the arrow 17, Fig. 3, to give access to the working parts within the casing. Said scroll member, when in its normal position, rests upon the edge of front strip 12, in which position it is held by the spring detent 48 (Fig. 3).

Extending across the top of the scroll portion 14, and welded or otherwise attached thereto, is a bar 18, to which a member 19 is pivoted at 20. Member 19 comprises a horizontal strip 19a which extends somewhat beyond the main part of said member on each side thereof and whose upper edge constitutes an eye guide, and also a weighted part 19b, which serves a purpose in connection with the feeding of the copy, as hereafter explained. Member 19 is shown in its closed position in Figs. 1 and 3, and in its open position in Fig. 2, in which latter position it rests against the upturned edge 18a of bar 18.

As indicated in Fig. 1, the width of the device is considerably less than that of an ordinary sheet of legal cap or letter paper, so that a sheet of such paper, when placed in the device as indicated at 22 (Figs. 1 and 3), projects a considerable distance beyond the scroll member on each side thereof. This is made possible by the fact that there are no supports or other parts at the sides of the device to interfere with the insertion of a sheet of paper of any standard width. Copy holders of the class to which this invention belongs, such as are now on the market, can be used only with sheets of paper of less width than that of the paper retainer. Hence, to be usable with the standard sizes of paper, the copy holder must be of such size as to occupy an amount of space on the typewriter support as is practically prohibitive in most cases. On the contrary, a copy holder made according to the present invention operates satisfactorily when made as small as 2½ inches in width, 4 inches in height, and 4½ inches from front to rear. In fact, it has been found that such a copy holder having a scroll member only two inches wide gives satisfactory service. Moreover, the copy holder of the present invention works equally well with all standard sizes of paper. Another advantage resulting from the projection of the sheet of paper beyond the scroll 14 is that part of the next line to that above the eye guide can be seen in advance.

Referring now to the paper feed mechanism within the casing, the feed roller 25 extends from one side 11 to the other of the casing and is removably journalled therein by means of pivot screws 30. It carries a ratchet wheel 26, preferably located midway between its ends, which ratchet wheel is engaged and rotated intermittently by a feed dog or pawl 27.

The feeding of the paper is effected by means of the rings 28 of rubber or other suitable material, which are seated in channels or grooves in roller 25, and are retained in position by their own tension. Said feed rings protrude slightly through suitable apertures 29 in part 14a of the scroll member, so that the paper sheet 22 is pressed against them by the member 19, the weight of which is so determined as to exert the proper degree of pressure for efficient operation. A weight is preferred to a spring for this purpose, as the use of a spring would entail complication and increase the cost of production without any compensating advantage.

By the use of rubber feed rings or tires as described, instead of using the extended surface of a roller, several important advantages are obtained. One of these is the facility with which the feed rings are replaced when worn, so that their renewal is a matter of very slight expense. But of even more importance is the greater efficiency, as feeding means, of the rings or tires as compared with the rubber surfaced roller. That increased efficiency takes the form of greater regularity of the feeding operation and of the accomplishment of the feeding operation by means of much less pressure than is required where a roller is used.

The feed rings have a very narrow line of contact with the paper as compared with the contacting area of a roller. It follows that the feed effected by the former is more regular than that effected by the latter, the reason being that the surface of a rubber roller is always uneven, which causes irregularities in the pressure exerted upon the paper at different points along the line of contact from side to side of the sheet. The case is very different with a feed ring, because its contact with the paper is confined to a narrow line, practically an edge. Hence the pressure it exerts thereon is practically uniform. Furthermore, the amount of pressure that is required for efficient feeding where feed rings are used is but a small fraction of that required where a roller is employed. This is due mainly to the fact that, since a feed ring presents a very narrow surface for contact with the paper, the pressure being therefore concentrated within narrow limits, a given pressure effects a grip upon the interlocking fibers of the paper which is far more effective, and at the same time more nearly uniform, than the same pressure distributed across the entire width of the paper.

It is further to be noted that the use of two spaced feed rings or tires assures more even feeding at both sides of the sheet than is attainable when a roller is used. Thus differential feeding, incident to the use of a single feed roller or platen, which tends to turn the paper sidewise, is avoided.

The elastic rings 28 are of considerably less internal diameter than that of their semi-circular retaining grooves or channels on roller 25. Hence they must be stretched considerably in order to seat them in said grooves. In order to facilitate that operation and to effect the positioning of each ring in its channel or groove without distorting or unevenly twisting the same, roller 25 has frusto-conical ends 32. These have at their extremities a diameter about the same as, or slightly less than, that of the ring 28. The latter is slipped on the cone and then rolled

into place by turning it evenly upon its own axis until it snaps into its groove or channel.

It will be observed that the roller 25 can be readily and quickly removed from the casing and a worn feed ring replaced by a new one by an unskilled person. Rubber rings suitable for the described purpose are obtainable at small cost.

The pawl or feed dog 27 which engages ratchet wheel 25 is pivoted at its lower end to lever 33, the latter is pivoted at 34, and its free arm extends through an aperture in the front strip 12 of the casing and carries at its outer end a flat, horizontal finger piece 35, which can be conveniently actuated by the operator without looking thereat.

A spiral tension spring 36 is attached at one end to feed dog or pawl 27 and at the other to the rear plate 10 of the casing. This spring has two functions, first, to exert a down pull on the feed dog 27, and second to draw the same towards the back plate. Said spring 36, in order that it may effectively serve both purposes, is inclined obliquely downwards from its point of attachment to pawl 27 to its point of attachment to plate 10. The angle of obliquity is determined by the amount of down pull required in comparison with the pull required to draw the end of the feed dog rearwardly for engagement with the next tooth, so that the power of the spring may be distributed accordingly.

Means are provided for varying the length of the feed stroke, so that each stroke may be effective to turn the feed ratchet the distance of one, two or three teeth, as may be desired; said teeth being so spaced that a stroke embracing one tooth moves the frictional surface of the feed rings three-sixteenths of an inch (which corresponds to one space of typewriting) a stroke embracing two teeth moves it twice that distance, and a stroke embracing three teeth three times. This is accomplished by means of three cam projections located at 37 on shaft 38, which has at one end a milled turning button 39 and at the other a pointer 40. Said cams are directly beneath lever 33 and are disposed on shaft 38 at a distance of 120° apart. These cams limit the extent of the down movement of feed dog 27. When the highest cam is directly beneath lever 33, which position corresponds with point 1 on the indicator, Fig. 2, the length of the stroke will be such as to feed the paper the distance of a single-spaced line. When shaft 38 is turned so that the pointer 40 points to 2, the length of stroke will be equal to a double-spaced line, and when at 3 it will be equal to a triple-spaced line.

41 is a brake-spring for applying suitable braking pressure to feed roller 25. Its pressure can be adjusted by means of screw 42.

When member 19 is thrown back, as shown in Fig. 2, the curved surface of part 19^b forms, with the opposite curved surface of the extension 14^a of the scroll member, a funnel-like mouth to the interior of the scroll; so that, by holding a paper sheet at its upper edge, it can be introduced into the scroll with slight effort or care, the increasing friction with the surface of the scroll serving to bring it to rest at about the right position, and to retain it when released by the hand until part 19 is returned to its operative or closed position. The surface of the scroll should be smooth polished, so as to permit the paper to slide easily and smoothly into the same.

What is claimed is:—

1. A copy holder comprising a scroll-shaped paper retainer having a reversely curved approximately upright extension facing toward the front of the holder and adapted to guide a sheet of copy upwardly along and in front thereof as said sheet is withdrawn from said retainer.

2. A copy holder comprising a scroll-shaped paper retainer having an approximately upright extension facing toward the front of the holder, and combined with paper feeding means adapted when actuated to move a sheet of copy upwardly along and in front of said extension while withdrawing said sheet from said retainer.

3. A copy holder, comprising a scroll-shaped paper retainer having a reversely curved extension, combined with a movable member adapted, when in its operating position, to exert yielding pressure upon a sheet of paper in said scroll-shaped member.

4. The combination of a scroll-shaped paper retainer; a movable member adapted, in its operating position, to exert yielding pressure upon a sheet of paper in said retainer; and paper feeding means.

5. The combination of a scroll-shaped paper retainer and a movable member adapted, in one position, to form one side of a funnel-like mouth to said retainer and in another position to exert pressure upon a sheet of paper in said retainer.

6. A copy holder comprising a casing, a scroll-shaped paper retainer forming one side of said casing and hinged to a stationary part thereof, and paper feeding means within said casing.

7. The combination of a scroll-shaped paper retainer so supported that a sheet of paper therein can project freely beyond the ends thereof; a movable member comprising an eye guide and a yielding pressure paper holder; and means for feeding a sheet of paper while held between said paper retainer and said pressure paper holder.

8. The combination of a scroll-shaped paper retainer having an upright extension and being so supported that a sheet of paper therein can project freely beyond the ends thereof; feeding means in the rear of said paper retainer, comprising a frictional surface which projects through an aperture in said retainer; and means for holding a paper sheet against said friction surface.

9. The combination of a scroll-shaped paper retainer; feeding means in the rear thereof, comprising one or more friction rings which project through apertures in said scroll member; and means for holding a paper sheet against said rings with yielding pressure.

10. The combination of a casing comprising fixed back and side walls; a movable scroll-shaped paper retainer forming the front of said casing; feeding means inside said casing, comprising one or more feed rings which project through apertures in said paper retainer; and means for holding a paper sheet in contact with said rings.

11. The combination of a casing; a scroll-shaped paper retainer constituting one wall thereof; a feed roller having one or more friction surfaces projecting through apertures in said scroll member; and operating means within said casing for imparting movement to said roller.

12. In a paper feeding mechanism, a feed roller having tapered or cone-shaped ends and having annular grooves or channels, and elastic feed rings of less internal diameter than the diameter of said grooves, adapted to be stretched and rolled over said conical surfaces, snapped into

place in said grooves, and retained in operative position therein by their own tension.

13. In a paper feeding mechanism, the combination of a feed roller, a ratchet wheel thereon, a feed dog for engagement with said ratchet, hand-operated means for imparting motion intermittently to said roller through said feed dog and ratchet, and adjusting means comprising a cam having a plurality of steps whereby the throw of said feed dog can be varied.

14. In a paper feeding mechanism, the combination of a feed roller, a ratchet wheel thereon, a feed dog for engagement with said ratchet, hand-operated means for imparting motion intermittently to said roller through said feed dog and ratchet, and adjusting means comprising a three-stepped cam whereby the throw of said feed dog can be varied to take in one, two or three teeth of the ratchet wheel at a stroke.

15. A copy holder comprising in combination, a tubular paper retainer for receiving a sheet of copy and having an exit opening extending lengthwise thereof; and an approximately upright extension member facing toward the front of the holder and positioned to guide the sheet of copy upwardly and in front thereof as said sheet is withdrawn from the retainer through its said exit opening.

16. A copy holder comprising in combination, a tubular paper retainer for receiving a sheet of copy and having an exit opening extending lengthwise thereof; an approximately upright extension member facing toward the front of the holder and positioned to guide the sheet of copy upwardly and in front thereof as said sheet is withdrawn from the retainer through its said exit opening; and paper feeding means for moving the sheet of copy upwardly out of the retainer and in front of said extension member.

17. A copy holder comprising in combination, a tubular paper retainer for receiving a sheet of copy and having an exit opening extending lengthwise thereof; an approximately upright extension member facing toward the front of the holder and positioned to guide the sheet of copy upwardly and in front thereof as said sheet is withdrawn from the retainer through its said exit opening; and paper feeding means for moving the sheet of copy upwardly out of the retainer and in front of said extension member; said feeding means including one or more rotatable feed members projecting forwardly through said extension member for engagement with the underside of the sheet of copy.

18. A copy holder comprising in combination, a tubular paper retainer for receiving a sheet of copy and having an exit opening extending lengthwise thereof; an approximately upright extension member facing toward the front of the holder and positioned to guide the sheet of copy upwardly and in front thereof as said sheet is withdrawn from the retainer through its said exit opening; paper-feeding means for moving the sheet of copy upwardly out of the retainer and in front of said extension member, said feeding means including one or more rotatable feed members projecting forwardly through said extension member for engagement with the rearward side of the sheet of copy; and a presser member engaging the forward side of the sheet of copy and pressing the sheet into engagement with said rotatable feed member or members.

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