March 30, 1937. A. J. SPRINGER 2,075,671

ROLLED PAPER FEEDER

Filed March 13, 1936

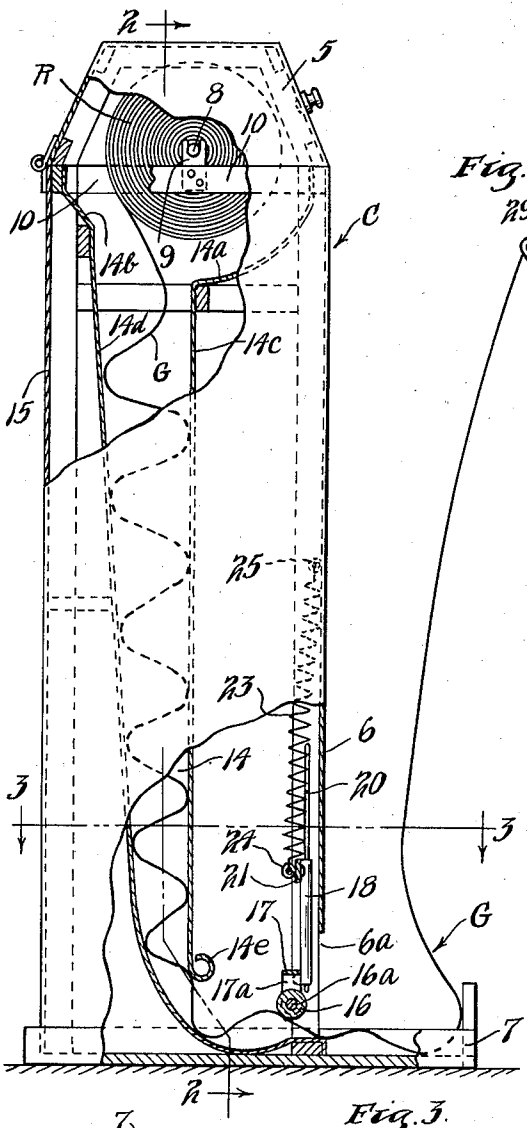


Fig. 1.

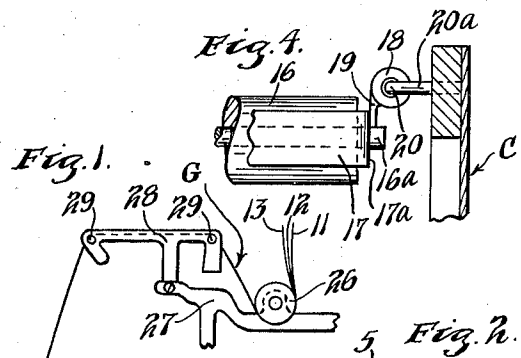


Fig. 4.

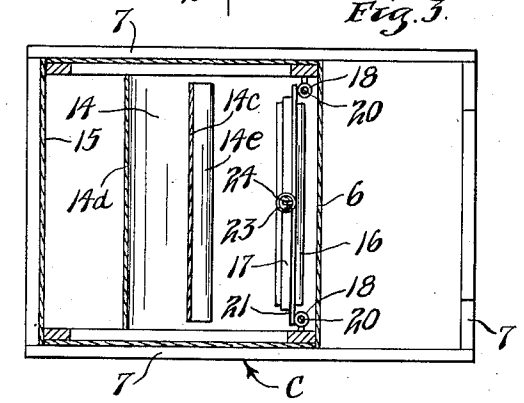


Fig. 3.

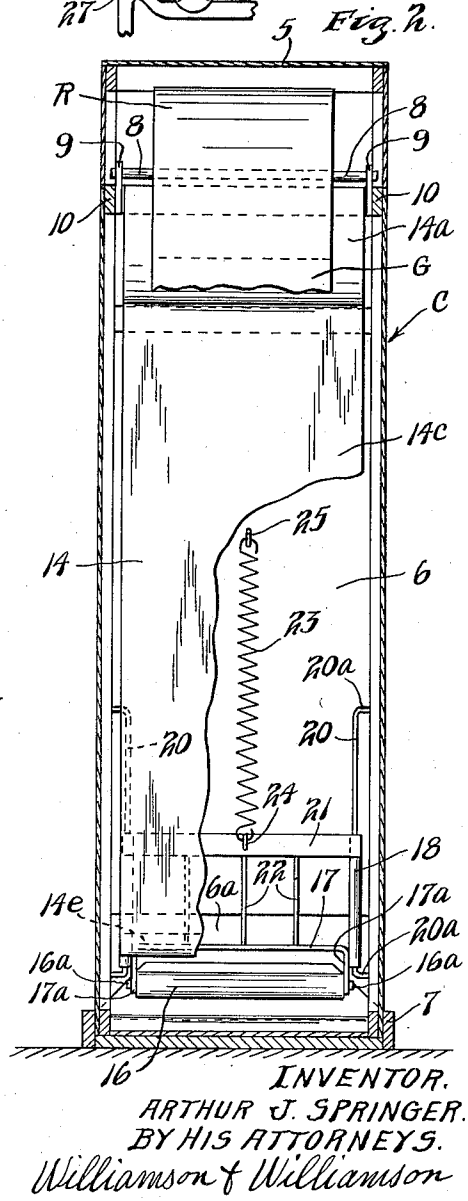


Fig. 2.

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Patented Mar. 30, 1937 2,075,671

UNITED STATES PATENT OFFICE

2,075,671

ROLLED PAPER FEEDER

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Application March 13, 1936, Serial No. 73,636

3 Claims. (Cl. 242—55)

My invention relates to feeders for rolled paper and particularly to such apparatus for feeding paper to platens of machines such as typewriters and the like.

In use of a typewriter where individual sheets of paper are used therein much time and energy are consumed in placing a new sheet in the typewriter each time a preceding sheet has been completed. This expenditure of time and energy is, of course, increased when duplicate and triplicate sheets are used.

An object of my invention is to provide paper feeding apparatus for feeding paper from a roll thereof to a typewriter or the like.

Another object is to provide such apparatus adapted for use with paper rolls containing a plurality of parallel strips of paper so as to provide for making of one or more copies of the original typewritten matter.

A further object is to provide such apparatus arranged to permit a typewriter to draw paper therefrom by applying but slight tension to the paper.

A still further object is to provide such apparatus wherein paper unrolls from the roll thereof responsive to gravity and at a rate corresponding to the rate of paper consumption in the typewriter.

These and other objects and advantages of the present invention will more fully appear from the following description, made in connection with the accompanying drawing, wherein like reference characters refer to the same or similar parts throughout the various views, and, in which,

Fig. 1 is a partially broken away side view of my apparatus shown in operative association with a portion of a typewriter;

Fig. 2 is a partially broken away sectional view taken along the line 2—2 of Fig. 1, as indicated by the arrows;

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 1, as indicated by the arrows, and

Fig. 4 is a detail view.

Referring to the drawing, my paper feeding apparatus is preferably housed in suitable enclosing means such as the cabinet C which, in addition to housing the apparatus, comprises a supporting structure from which various parts of the apparatus may be supported. The cabinet C is arranged to permit convenient access to the interior thereof by providing a hinged closure or cover 5 which normally closes the upper end of the cabinet. The lower portion of the front wall 6 of the cabinet C is cut away to form a generally rectangular aperture 6a therein. The cabinet C sets in and is suitably secured to a shallow tray 7 which extends a moderate distance forwardly of the front wall 6 of the cabinet C.

An elongated horizontal element or rod 8, disposed parallel to the front wall 6 of the cabinet C is journalled at its respective ends in bearing members 9 projecting upwardly from and carried by cross bars 10 mounted in and supported by the cabinet C. The bearing members 9 are formed of relatively thin material and are provided with upwardly facing notches in which the rod 8 is received. The cross bars 10 are mounted in the uppermost portion of the cabinet C so that the rod 8 is disposed at a level above the level of the lower edge of the cover 5 when the cover 5 is in its normal closed position.

Three strips 11, 12 and 13, of paper suitable for use in a typewriter are placed together in compact parallel relation to each other to form a group G of strips. The strips 11, 12 and 13 are preferably of the same width as standard sheets of typewriter paper and are of relatively great length. The group G of sheets 11, 12 and 13 is rolled to form a compact roll R which is placed on the rod 8 in concentric relation thereto so as to be rotatable relative to the cabinet C. The roll R, when so placed, serves as a supply roll from which the outer layer thereof, comprising the group G of strips acting as a single laminated unit, may be so unrolled as to move from the roll tangentially and downwardly.

Within the cabinet C a vertically extending chute or guide duct 14, of rectangular cross section, is provided including front and rear walls 14c and 14d preferably constructed of sheet material such as sheet metal. Portions of the side walls of the cabinet C act as the side walls of the duct 14. The duct 14 extends from close below the roll R to the lower portion of the cabinet C. The front and rear walls 14c and 14d of the duct 14 comprise paper guiding aprons and, in their upper portions, are extended outwardly and upwardly to the upper ends of the respective front and rear walls 6 and 15 of the cabinet C to form auxiliary aprons 14a and 14b, which are secured at their outer edges to the respective front and rear walls 6 and 15 of the cabinet C by suitable means. Of the front and rear walls of the duct 14, one is disposed, at its upper end, relatively close to the corresponding wall of the cabinet C and the other is in substantial vertical alignment with the axis of the roll R so that the open upper end of the duct 14 will be disposed below the portion of the roll R from which the group G

of strips 11, 12 and 13 depends. The centrally located one of the front and rear walls of the duct 14 is substantially vertically disposed and the other of the front and rear walls of the duct 14 is disposed at an angle thereto so that the front to rear dimension of the duct 14 converges downwardly. The width of the duct 14 slightly exceeds the width of the paper strips 11, 12 and 13.

The front wall 14c of the duct 14 terminates at its lower end a moderate distance above the bottom of the cabinet C and the lower end thereof is provided with a rounded guide element 14e as by rolling, as shown, or by other suitable means.

The rear duct wall or guide apron 14d curves forwardly in its lower portion in spaced relation to the guide element 14e and at its end is secured to the front wall 6 of the casing C at the lower limit of the rectangular aperture 6a.

A second horizontal guide means is provided just inside the front wall 6 of the casing C traversing the aperture 6a a relatively short distance above the lower limit thereof. This guide means preferably consists of a revoluble element and preferably is so mounted as to be shiftable upwardly in response to a relatively slight upwardly directed force applied thereto. To this end, the guide means consists of a revoluble element or roller 16 having pintles 16a extending axially from its respective ends and journaled in respective apertured depending legs 17a of a yoke 17 of wide, shallow, inverted U-shape. Vertically disposed sleeves 18, secured to the respective ends of the yoke 17 by means of lugs or arm 19, are mounted on respective ones of a pair of vertically disposed guide rods 20 which have upper and lower end portions 20a bent at right angles and secured to suitable portions of the casing C for support therefrom. A cross bar 21 is secured at its respective ends to the upper ends of the respective sleeves 18 and brace rods 22 extend vertically between the cross bar 21 and the horizontal portion of the yoke 17. The sleeves 18 sliding vertically on the rods 20 obviously comprise means for guiding the roller carrying yoke 17 in vertical movement and limiting the movement thereof to vertical movement.

Resilient means is provided to support the weight of the shiftable assembly formed by the roller 16, yoke 17, sleeves 18, cross bar 21 and braces 22 so that the roller 16 may be shifted upwardly by a relatively slight upwardly directed force applied thereto. For this purpose the respective ends of a relatively long helical tension spring 23 are connected to eyes 24 and 25 respectively mounted on the cross-bar 21 and the inner side of the front wall 6 of the cabinet C. The spring 23 is so tensioned as to just support the above mentioned shiftable assembly when the guide roller 16 is substantially at its lower limit of movement.

In Fig. 1, 26 and 27 refer respectively to the platen and carriage of a typewriter with which my apparatus is operatively associated. A pair of generally T-shaped frames 28 are mounted on the carriage 27 at the respective ends thereof in parallel relation to each other. Guide bars or rods 29 are secured at their respective ends to the respective frames 28. One of the bars 29 is situated at the rear and one at the front of the horizontal upper portions of the frames 28 and both of the bars 29 are disposed parallel to the axis of the platen 26. The locations and proportions of the frames 28 are such that the bars 29 are above and to the rear of the platen 26. The typewriter is normally so positioned relative to the cabinet C that the axes of the platen 26 and the roll R are parallel and the guide bars 29 are above and slightly forward of the forward portion of the tray 7.

In normal use of my paper feeding device a portion of the group G of strips 11, 12 and 13 extends from the roll R to the platen 26 of a typewriter through a path extending from the roll R downwardly through the duct 14, under the guide elements 14e and 16, out of the cabinet C through the aperture 6 into the forward portion of the tray 7, upwardly toward the typewriter, over the guide bars 29, and downwardly and forwardly to the platen 26.

The weight of the strips 11, 12 and 13 will cause sufficient paper to unroll from the roll R so that a quantity of the paper will be disposed within the duct 14 in a wavy or undulate formation (substantially as shown in Fig. 1), more or less supported by the converging front and rear walls 14e and 14d of the duct 14. As paper is drawn from the lower end of the duct 14 the undulations in the paper strips tend to straighten out and hence the paper is supported by the front and rear walls 14c and 14d to a diminishing degree whereby the weight of the paper strips depending from the roll R will cause the roll R to rotate and deliver paper into the duct 14 until re-establishment of the undulant formation prevents gravity from causing further unrolling of paper. From the above it should be obvious that a supply of paper of a quantity ranging within relatively small limits is automatically maintained within the duct 14 without the application of any force other than the pull of gravity. It also should be noted that the paper in the duct 14 is in a loose formation such that only very slight tension on the paper strips is required to draw the same from the lower end of the duct 14.

It should be apparent that rotational progression of the platen 26 of the typewriter, as in normal use of the typewriter, will draw the paper strips over the guide rods 29 and that the strips will move out of the lower end of the duct 14 and under the shiftable guide roller 16 to supply the lengths of strips drawn into the typewriter. If paper should be drawn into or through the typewriter suddenly so as to tend to produce an excessive tension in the portions of the strips between the lower end of the duct 14 and the platen 26, the guide roller 16 will quickly and easily shift upwardly in response to such sudden drawing of paper so as to prevent production of tension in the strips of the paper sufficient to entail any possibility of tearing or breaking of the strips 11, 12 and 13 or slippage of the platen 26 relative to the group G of strips 11, 12 and 13. From the above it should be apparent that my apparatus substantially eliminates the possibility of paper breakage and delays resultant therefrom.

When a portion of the strips 11, 12 and 13 of a length corresponding to the length of an ordinary individual sheet of typewriter paper has had the desired matter typed thereon, such portion may be torn at its lower edge from the following portions of the strips whereafter another similar portion is ready for use with no need for any manipulation other than rotating the platen of the typewriter through a small angle.

While three strips 11, 12 and 13 are illustrated and described as comprising the group G, it should be understood that the group G may comprise any desired number of strips and

also that alternate strips may be of carbon paper if desired. Carbon paper, however, is not required when my apparatus is used in connection with the conventional copy producing form of typewriter wherein a plurality of ribbons are employed in producing duplicates and triplicates of the original typewritten matter. The strips 11, 12 and 13 may, of course, have any desired commercial form, such as bill of lading, invoice or other form, printed thereon.

It is apparent that I have invented a novel, effective, simple and reliable type of rolled paper feeder particularly adapted for use with typewriters and the like.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of the present invention.

What is claimed is:

1. Apparatus for automatically controlling the feeding of a strip of relatively flexible sheet material from a horizontally axised roll thereof revolubly supported for unrolling of said strip responsive to the pull of gravity on a depending free end portion of said strip of sufficient length comprising, a downwardly convergent, substantially vertically disposed paper guiding duct situated for depending of said strip downwardly therethrough and of length at least equalling said sufficient length, and means associated with the lower end of said duct tending to restrain exit of said strip from said duct whereby portions of said strip will accumulate within said duct and assume an undulant conformation frictionally engaging said duct to derive support therefrom for relieving said roll of most of the weight of said strip and thus stopping gravity actuated feeding of said strip from said roll until withdrawal of a portion of said strip from the lower end of said duct causes descent of said undulant portion of said strip in said duct.

2. Apparatus for automatically feeding a strip of relatively flexible material from a roll thereof comprising, means supporting said roll with the rotational axis of the same horizontal and said roll relatively free for rotation about said axis, a downwardly convergent substantially vertical duct so situated that an unrolled free end portion of said strip will depend from said roll through said duct, the length of said duct being such that said unrolled free end portion, when extending to the lower end of said duct, will have sufficient weight to cause unrolling of said strip from said roll responsive to the pull of gravity, and means associated with the lower end of said duct tending to impede movement of said strip beyond said lower end whereby unrolled portions of said strip will accumulate within said duct in undulant conformation and thereby frictionally engage said duct to derive support therefrom and thus reduce the amount of said unrolled strip supported by said roll to less than the amount required to produce unrolling of said strip from said roll responsive to gravity.

3. Apparatus for automatically controlling the feeding of a strip of relatively flexible sheet material from a horizontally axised roll thereof revolubly supported for unrolling of said strip responsive to the pull of gravity on the depending free end of said strip comprising, a pair of sheets of relatively rigid material disposed in generally vertical planes substantially parallel to the axis of said roll and situated to receive said depending free end therebetween, said sheets being spaced apart at their upper ends and converging downwardly therefrom to their lower ends, the lower end of one of said sheets being extended in a curve downwardly and past the lower end of the other of said sheets in downwardly spaced relation therewith to form a substantially horizontally facing discharge port for said strip and a curved surface ahead of said port for frictionally engaging said strip to restrain the same from feeding out of said port responsive to gravity alone.

ARTHUR J. SPRINGER.