E. A. FEDDERSEN AND R. F. SCHOTT.

SHEET FEEDING DEVICE.

APPLICATION FILED MAR 9, 1920.

1,375,042.

Patented Apr. 19, 1921.

3 SHEETS—SHEET 1.

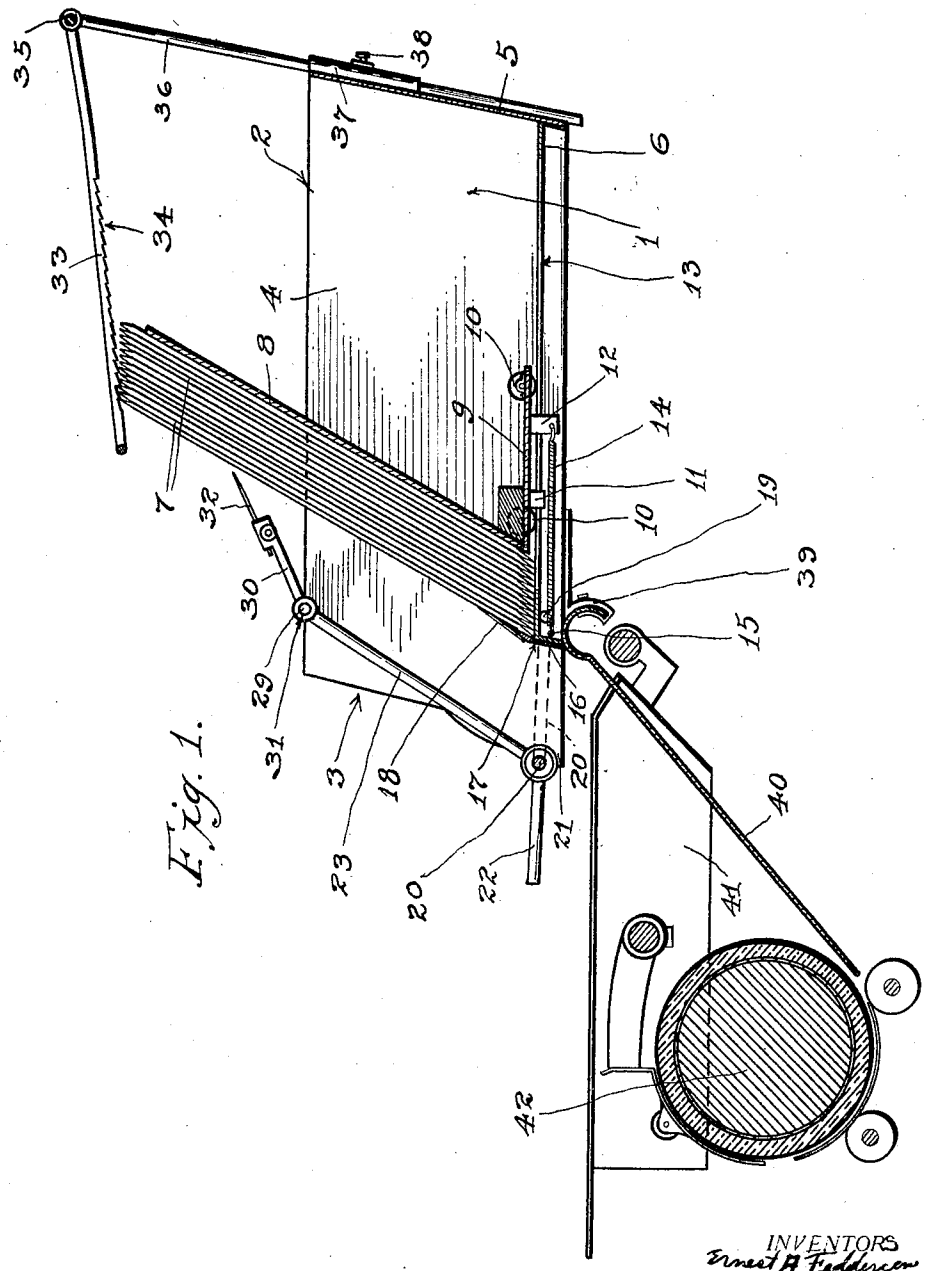


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

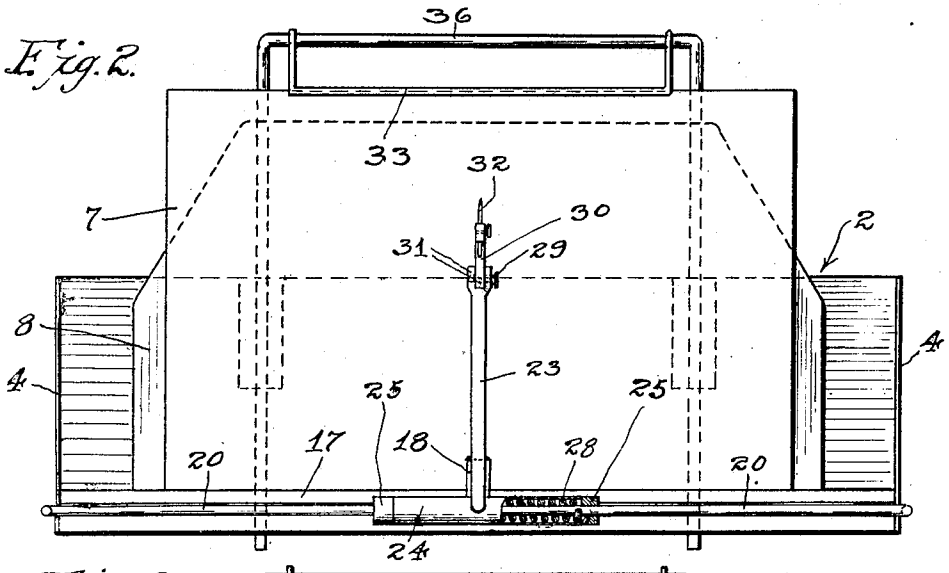
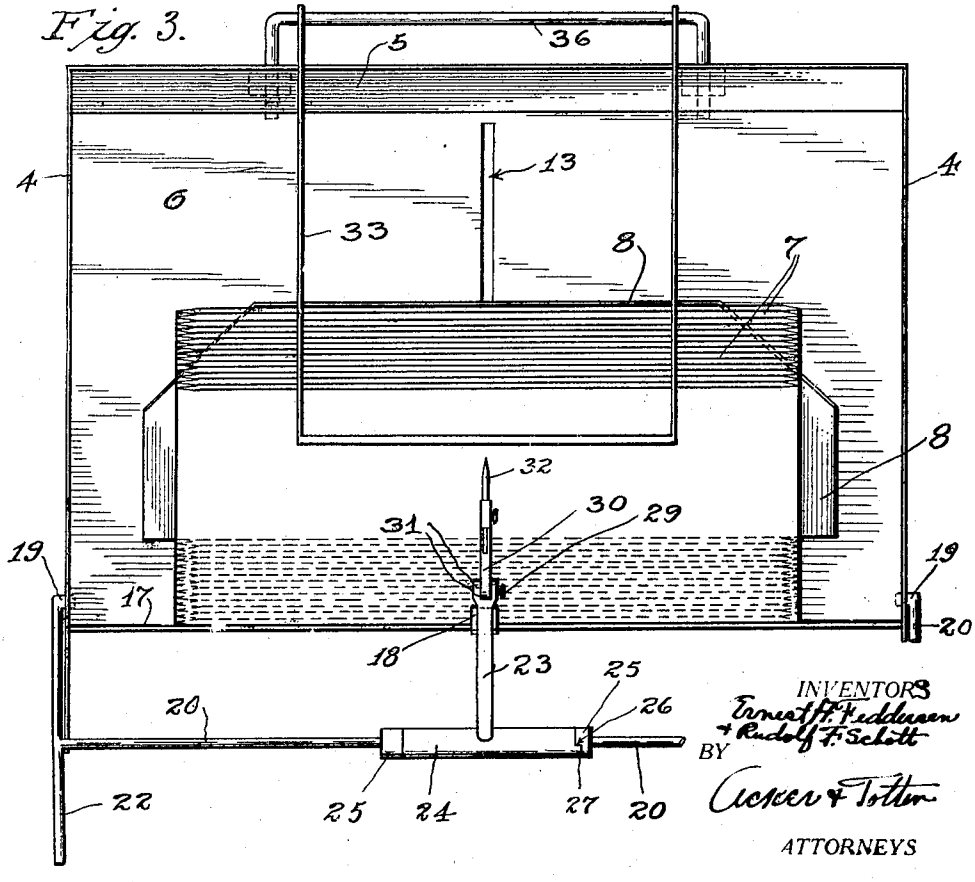


Fig. 3.



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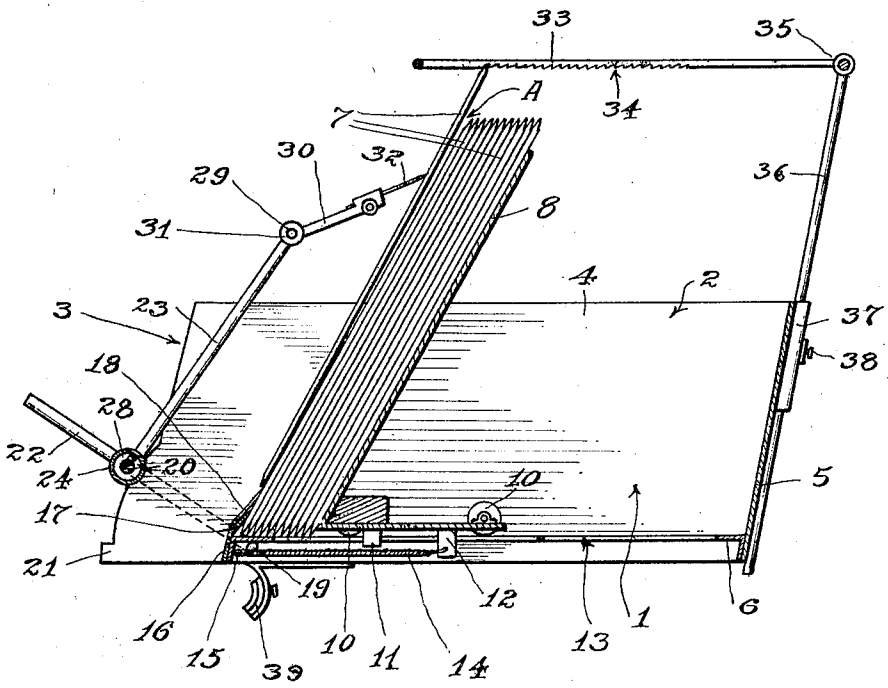
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3 SHEETS—SHEET 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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SHEET-FEEDING DEVICE.

1,375,042. Specification of Letters Patent. Patented Apr. 19, 1921.

Application filed March 9, 1920. Serial No. 364,476.

To all whom it may concern:

Be it known that we, ERNEST A. FEDDERSEN and RUDOLF F. SCHOTT, the said FEDDERSEN being a subject of Germany and the said SCHOTT a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Sheet-Feeding Devices, of which the following is a specification.

The present invention relates to improvements in sheet feeding devices and more particularly to a type of apparatus adapted for positioning in proximity to a typewriter carriage and for containing envelops or other sheets which are capable on the operation of the machine of being removed successively one at a time from the apparatus and delivered to writing position on the typewriter carriage.

The present invention has for its principal objects to provide a novel retaining lip whereby the sheets are held within the feeding device and are adapted to be separated one from the other on the operation of the removing means, insuring delivery of a single sheet from the apparatus on each successive operation thereof. To provide a construction wherein is employed a means for evenly presenting the sheets to the removing apparatus, and one wherein a suitable follower is provided for exerting pressure evenly over the sheets to move the same forwardly as the forward sheets are successively removed from the apparatus. A further object is to provide a means whereby an air pocket is provided between the foremost and next succeeding sheet to permit the raised sheet to drop by gravity from the apparatus.

With the above mentioned and other objects in view the invention consists in the novel construction and combination of parts hereinafter described illustrated in the accompanying drawings, and set forth in the claims hereto appended, it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

To more fully comprehend the invention, reference is directed to the accompanying drawings, wherein,

Figure 1 is a longitudinal sectional view of the preferred embodiment of our invention.

Fig. 2 is a view in front elevation.

Fig. 3 is a view in top plan.

Fig. 4 is a view similar to Fig. 1, illustrating the apparatus detached from the typewriter carriage and the sheet removal means in operative position.

In the drawings wherein like characters of reference designate corresponding parts, the numeral 1 indicates a suitable sheet retaining receptacle, having an open top 2, and open at one end, preferably the forward end as at 3, said receptacle consisting of the side walls 4, back wall 5 and bottom wall 6, as illustrated in Figs. 1 and 3 of the drawings.

The sheets as positioned within the receptacle 1 for delivery or removal successively therefrom are preferably placed vertically within the receptacle to extend transversely thereof and inclined slightly toward the rear wall 5, of the receptacle. The sheets 7 rest preferably on the upper surface of the bottom wall 6, and the rearmost sheet is supported by a suitable inclined follower plate 8, extending transversely of the receptacle 1 and having a laterally extended base 9, disposed slightly above the bottom wall 6 of the receptacle, as is indicated in Fig. 1. To insure the easy movement of the base on the bottom wall 6, the same is provided with a plurality of supporting rolls 10, fulcrumed in pairs at the front and rear edges of said base to provide a bearing surface for the base downward over the surface of the bottom wall 6. To insure the correct guiding of the follower plate 8 forwardly of the receptacle 1, the base thereof is provided preferably in its longitudinal center with the downwardly extended fingers 11 and 12, arranged in alinement and preferably positioned one adjacent the forward end of the base, and the other adjacent the rear wall of the base. Said fingers 11 and 12 project into and through a suitable longitudinal slot 13 formed in the bottom wall 6, and to the finger 12 is connected one end of a coiled spring 14, the opposite end of which is preferably connected as at 15 to the flange 16 extending downwardly from the forward edge of the bottom wall 6, as indicated in Fig. 1. The construction of the follower plate above described and having associated therewith a spring insures a movement of the follower plate from the rear toward the forward end

of the receptacle 1 to maintain the sheets in stacked relation and to move a stack forwardly as the foremost sheet is successively removed from the receptacle.

Extending upwardly from the front face of the flange 16 is a suitable retaining lip 17 which mounts a suitable spring retaining finger 18, projecting above the same and preferably of a width less than that of the lip 17.

To successively remove the foremost sheet 7 of the stack to permit the same to fall by gravity over the spring retainer finger 18 and lip 17, we prefer to employ the following mechanism:

Fulcrumed at opposite ends as at 19 in opposite side walls 4 are the parallel portions of a suitable operating frame 20 extending transversely of the open front end of the receptacle 1, as indicated in Figs. 1, 2 and 3 of the drawings. This frame normally rests on the lugs or flanges 21 and carries either at one or both ends a forwardly extended operating handle 22 whereby a lifting movement may be imparted to said operating frame 20.

Within its length preferably at a point centrally of the width of the sheet 7, within the stack, we provide a vertically disposed needle arm 23, the lower end of which carries a right angularly disposed tubular bearing portion 24, through which extends the frame 20, and to preclude longitudinal movement of the bearing portion on the frame, we prefer to position at opposite ends thereof, suitable retaining collars 25 one of which is recessed as at 26 and accommodates a lug 27 carried on one end of the member 24. A coiled spring 28 is positioned within the tubular member 24, between the collars 25 and one end thereof is secured to the member 24 and the opposite end preferably to one of the collars 25, as indicated in Fig. 2 of the drawings whereby the needle arm 23, is at all times pressed forwardly toward the foremost sheet 7 of the stack. Normally the frame 20 rests on the lugs 21 at which time the wall of the lug 27 is in engagement with the wall of the recess 26, causing a movement of the free end of the needle arm in a direction away from the foremost sheet 7 of the stack. Pivotally connected as at 29 to the upper free end of the needle arm 23, is a needle mounting finger 30, which in its pivotal movement is normally disposed at an incline toward the foremost sheets 7 of the stack at an angle greater than the normal angle of the arm 23 and is arrested in its pivotal movement by the engagement of cooperating lugs 31, one carried by the arm 23 and the other by the finger 30. The free upper end of the finger 30 adjustably mounts a sheet engaging needle 32, which projects beyond the end thereof, and the front of which is adapted on the raising of the frame 20 to engage the foremost sheet of the stack lifting the same from engagement with the flange 17 and retaining lip 18, placing the same in a position to drop by gravity on the lowering of the frame 20, as hereinafter described.

To slightly space the upper end of the foremost sheet from the remainder of the stack as the foremost sheet is removed from the stack and to maintain the top of the sheets parallel with the bottom wall 6 of the receptacle, we prefer to employ a suitable pivoted frame 33 overlying the stack of sheets, and the members forming said frame are preferably formed on their under-face with serrations or teeth 34. The frame at its rear is fulcrumed as at 35 preferably to a U-shaped bracket 36, disposed vertically of the rear wall 5 of the receptacle, and passing through suitable guides 37 carried by said rear wall. Clamp screws 38 associated with the guides 37 are adapted for maintaining the bracket in its adjusted position relative to the wall 5.

We have illustrated the receptacle as carrying an attaching bracket 39, secured preferably to the paper table 40 of a typewriter carriage 41 whereby the foremost sheet as successively removed from the stack within the receptacle, drops by gravity onto the table 40, and in position to be operated on by the platen or carriage-roll 42.

The device being assembled as in the drawings, the same operates in the following manner:

The operator lifting the operating handle 22 raises the frame 20 causing a movement thereof upwardly in an arcuate path. This upward arcuate movement of the frame 20 throws the needle arm 23, finger 30 and pin 32 toward the foremost sheet 7 of the stack until the foremost sheet is engaged by the pin 32, at which time axial movement of the sleeve 24 about the frame 20 takes place, disengaging the surfaces of the recess 26 and lug 27. The finger 30 also fulcrums on 29 and during the upward movement of the foremost sheet 7 from the stack the upper edge thereof engages one of the serrations 34 of the frame 33. This continued upward movement of the pin 32 first withdraws the lower edge of the foremost sheet from in rear of the lip 17, so that it is securely held at its lower edge by the spring finger 18.

The contact of the lower edge of the sheet with the spring finger 18 insures the separation of the sheets should one be raised relative to the lip by frictional contact with the foremost sheet, as this raising movement of the foremost sheet causes a separation of the upper edge of the foremost sheet from the next succeeding sheet to provide an air pocket "A" between the sheets as in Fig. 4 which breaks the frictional contact between the foremost and next succeeding sheet during

the raising of the foremost sheet. Only a slight movement of the frame 20 is required as indicated in Fig. 4 to remove the foremost sheet from the stack at which time the operator releases the frame 20 permitting the same to drop by gravity, at which time the parts assume the position as in Fig. 1, and the removed sheet drops by gravity onto the table 40, Fig. 1 of the drawings.

Having thus described our invention what we claim as new and desire to protect by Letters Patent is:—

1. A sheet feeding apparatus including a receptacle open at one end and adapted for containing a plurality of sheets positioned therein in stack formation edgewise and at an incline toward the rear of the receptacle, means for forcing the sheets toward the open end of the receptacle, an upstanding member at the lower edge of the open end of the receptacle against which the lower edge of the foremost sheet of the stack is in frictional contact, means at the open end of the receptacle capable of movement to operative position for engaging the foremost sheet of the stack to raise the same free of said upstanding member, and means coöperating with said sheet as the same is raised for separating the upper edge thereof from the next succeeding sheet of the stack to provide an air space between said sheets to permit said raised sheet to fall by gravity free of the open end of the receptacle and over the face of the next succeeding sheet of the stack on the return of the sheet engaging means to normal position.

2. A sheet feeding apparatus including a receptacle open at one end and adapted for containing a plurality of sheets positioned therein in stack formation edgewise and at an incline toward the rear of the receptacle, means for forcing the sheets toward the open end of the receptacle, an upstanding member at the lower edge of the open end of the receptacle against which the lower edge of the foremost sheet of the stack is in frictional contact, means at the open end of the receptacle capable of movement to operative position for engaging the foremost sheet of the stack to raise the same free of said upstanding member, and a notched frame overlying the stack of sheets and movable upwardly with said foremost sheet as the same is raised to move the upper edge of the raised sheet forwardly of the next succeeding sheet of the stack to provide an air space between said sheets to permit said raised sheet to fall by gravity free of the open end of the receptacle and over the face of the next succeeding sheet of the stack on the return of the sheet engaging means to normal position.

3. A sheet feeding apparatus including a receptacle open at one end and adapted for containing a plurality of sheets positioned therein in stack formation edgewise and at an incline toward the rear of the receptacle, means for forcing the sheets toward the open end of the receptacle, an upstanding member at the lower edge of the open end of the receptacle against which the lower edge of the foremost sheet of the stack is in frictional contact, a frame pivoted adjacent the open end of the receptacle to swing in an arcuate path, a needle arm fulcrumed on the frame, a spring for forcing said arm toward the foremost sheet of the stack, a stop for said arm, a finger pivoted to the upper end of said arm, and a needle adjustably carried by the said finger and adapted on the pivotal movement of the frame to operative position to engage the foremost sheet of the stack and to raise the same upwardly over the face of the next succeeding sheet and free of said upstanding member, said needle on the movement of said frame to normal position adapted to move in a direction from said stack to permit said raised sheet to drop by gravity over the foremost sheet of the stack.

4. A sheet feeding apparatus including a receptacle open at one end and adapted for containing a plurality of sheets positioned therein in stack formation edgewise and at an incline toward the rear of the receptacle, means for forcing the sheets toward the open end of the receptacle, an upstanding member at the lower edge of the open end of the receptacle against which the lower edge of the foremost sheet of the stack is in frictional contact, a frame pivoted adjacent the open end of the receptacle to swing in an arcuate path, and a needle adjustably associated with the free end of said frame for engaging the foremost sheet of the stack to raise the same free of said upstanding member and to permit the same to drop by gravity over the face of the next succeeding sheet of the stack on the return of the frame to normal position.

5. A sheet feeding apparatus comprising a receptacle open at one end and adapted for containing a plurality of sheets positioned therein in stack formation edgewise; a flange at the lower edge of the open end of the receptacle for limiting the normal forward movement of the stack of sheets within the receptacle; a follower within the receptacle for forcing the foremost sheet of the stack against said flange; means for removing the foremost sheet of the stack from in rear of said flange and for discharging the same from the receptacle; and a spring finger extended upwardly above the flange for exerting a slight pressure on said first sheet after the same is removed from in rear of said flange and prior to discharging the same from the receptacle.

6. A sheet feeding apparatus comprising a receptacle open at one end and adapted

for containing a plurality of sheets positioned therein in stack formation edgewise; a flange at the lower edge of the open end of the receptacle for limiting the normal forward movement of the stack of sheets within the receptacle; a follower within the receptacle for forcing the foremost sheet of the stack against said flange; means for removing the foremost sheet of the stack from in rear of said flange and for discharging the same from the receptacle; and a means extending upwardly above the flange for guiding the discharge sheet over said flange in its discharge from the receptacle.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ERNEST A. FEDDERSEN.
RUDOLF F. SCHOTT.

Witnesses:
HARRY A. TOTTEN,
D. B. RICHARDS.