W. C. AVERY.

PAPER FEEDING APPARATUS FOR TYPEWRITERS.

APPLICATION FILED MAR. 13, 1920.

1,373,700.

Patented Apr. 5, 1921.

4 SHEETS—SHEET 1.

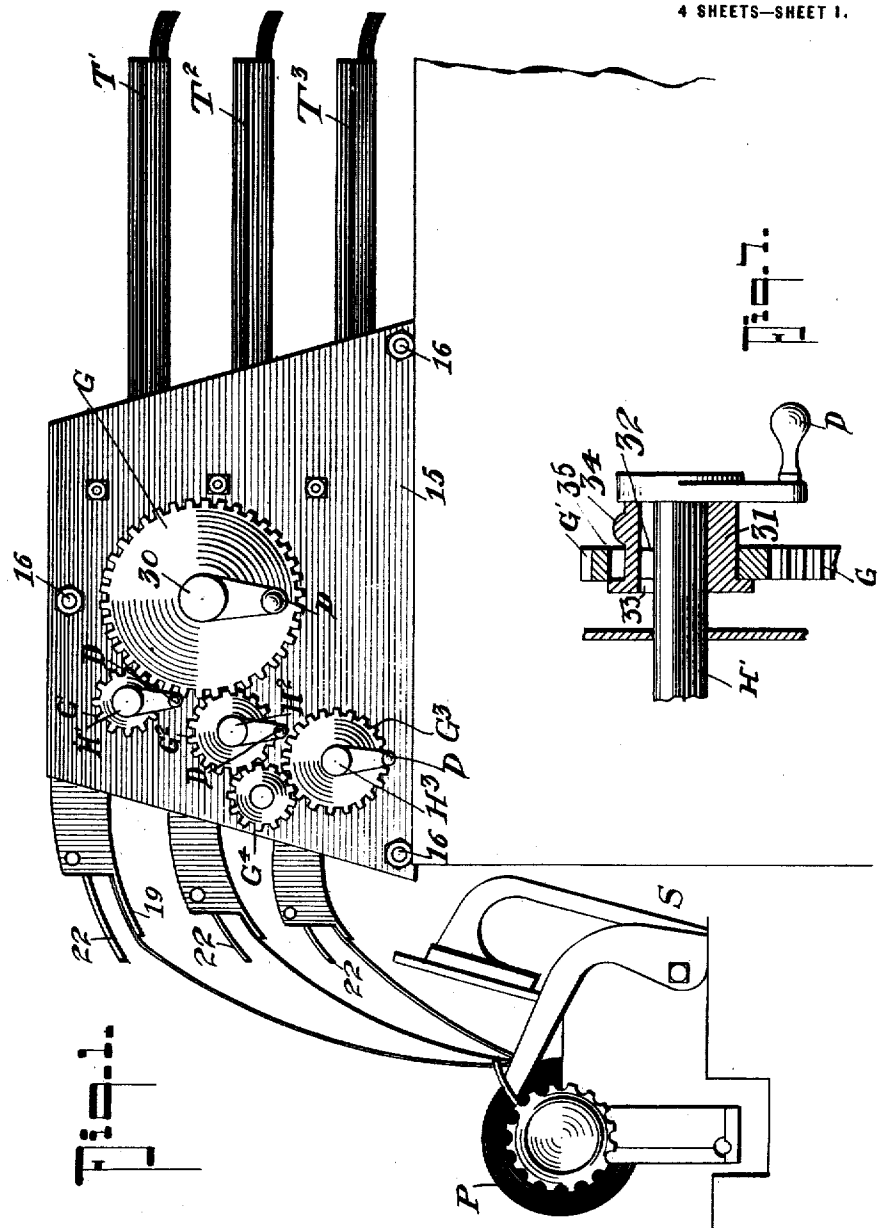


Fig. 1.

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WITNESSES

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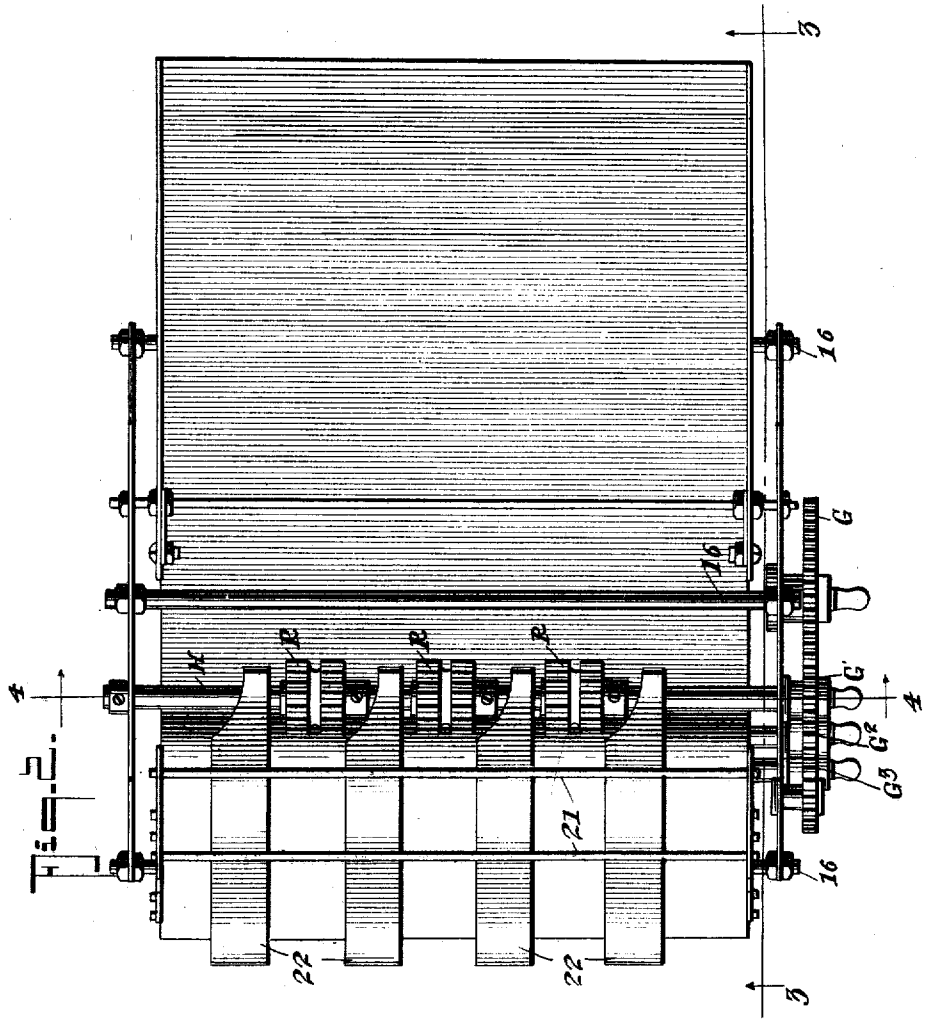


Fig. 2.

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4 SHEETS—SHEET 3.

Fig. 3.

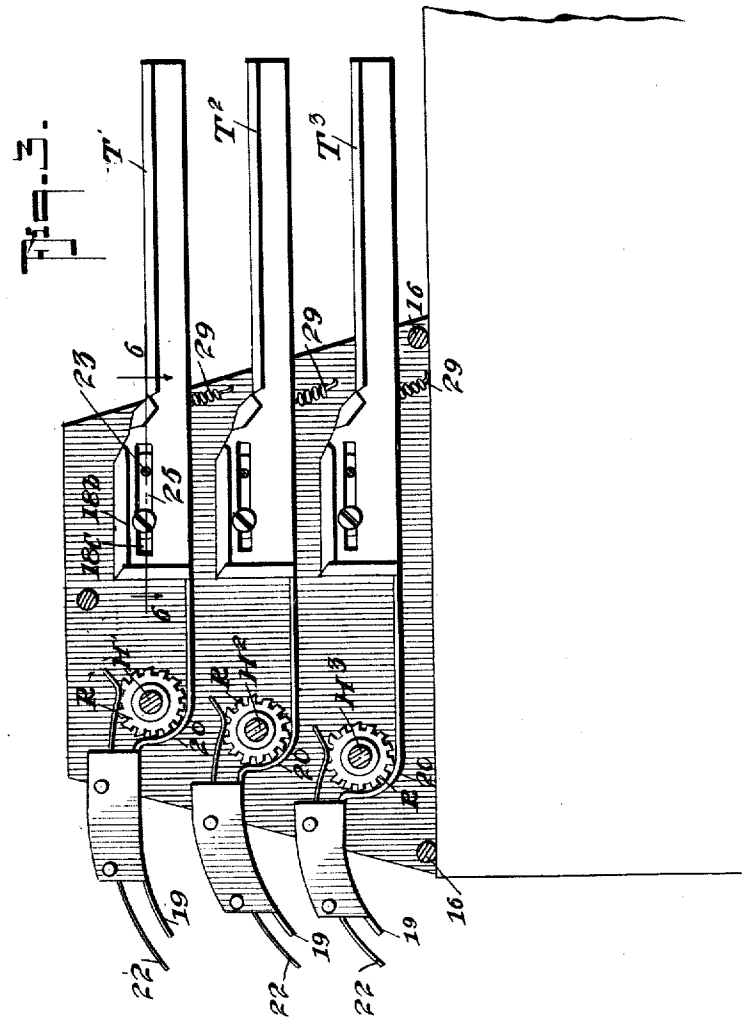
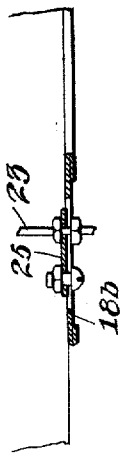


Fig. 6.



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4 SHEETS—SHEET 4.

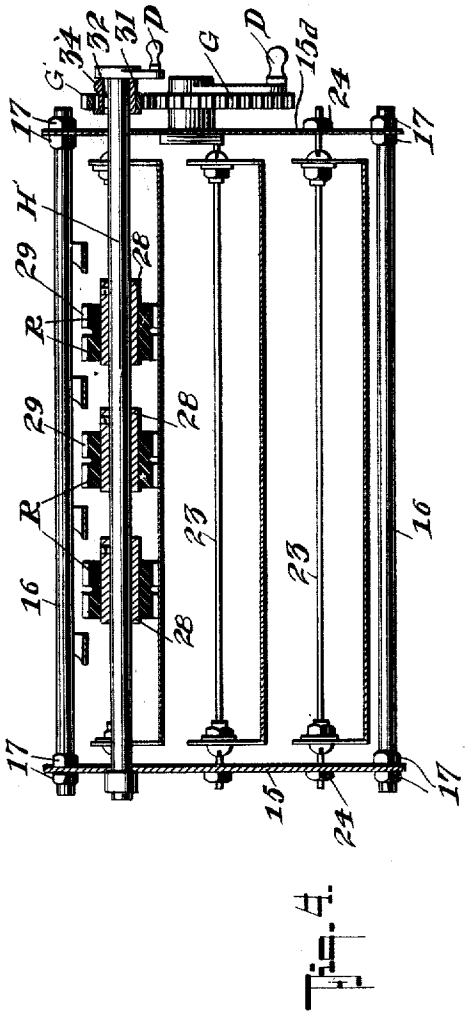


Fig. 4.

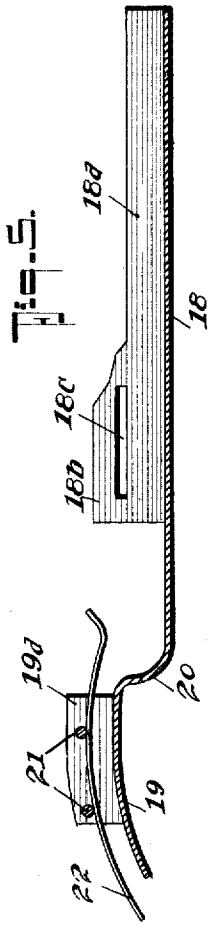


Fig. 5.



Fig. 6.

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UNITED STATES PATENT OFFICE.

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PAPER-FEEDING APPARATUS FOR TYPEWRITERS.

1,373,700. Specification of Letters Patent. Patented Apr. 5, 1921.

Application filed March 13, 1920. Serial No. 365,408.

To all whom it may concern:

Be it known that I, WILLIAM CHARLES AVERY, a citizen of the United States, and a resident of Honolulu, Territory of Hawaii, have invented certain new and useful Improvements in Paper-Feeding Apparatus for Typewriters, of which the following is a specification.

My invention relates to apparatus for feeding sheets of paper to a typewriter, and a purpose of my invention is the provision of an apparatus of simple and efficient construction which is capable of simultaneously feeding a plurality of sheets of paper to any standard form of typewriter.

It is also a purpose of my invention to provide a paper feeding apparatus, including trays for supporting the paper, such trays being balanced to coact with feed rollers to effect a simultaneous feeding of a plurality of sheets of paper in such manner that the several sheets will occupy corresponding positions on the platen of a typewriter.

A further purpose of my invention is the provision of a paper feeding apparatus having mechanism for actuating the feed rollers either simultaneously or independently of each other so that an arbitrary number of sheets may be fed to a typewriter.

I will describe one form of paper feeding apparatus embodying my invention, and will then point out the novel features in claims.

In the accompanying drawings:

Figure 1 is a view showing the platen of a standard form of typewriter adjacent which is arranged one form of paper feeding apparatus embodying my invention.

Fig. 2 is a top plan view of the apparatus shown in Fig. 1.

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 2.

Fig. 5 is a longitudinal sectional view of one of the trays shown in the preceding views.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 3.

Fig. 7 is an enlarged detail sectional view showing the manner in which one of the gears for one of the feed roller shafts is connected thereto.

Fig. 8 is a detail perspective view of one of the locking plates used in effecting a locking of the trays.

Similar reference characters refer to similar parts in each of the several views.

Referring specifically to the drawings and particularly to Fig. 1 P designates the platen of a standard form of typewriter which as shown is arranged in advance of a support S upon which is supported the paper feeding apparatus embodying my invention. As illustrated to advantage in Fig. 4, the apparatus comprises a frame including a pair of plates 15 and 15^a which are secured together in spaced parallel relation by three rods 16, the opposite ends of which latter are threaded to receive retaining nuts 17. Supported between the plates 15 and 15^a are a plurality of trays T, I in the present instance having shown three of such trays that are designated by the exponents of the letter T. As shown in Figs. 3 and 5, each tray comprises a linear portion 18, a curved portion 19 disposed above the linear portion and connected thereto by an upwardly curved portion 20. The linear portion 18 is provided along its longitudinal edges with flanges 18^a having relatively wide portions 18^b which are slotted as at 18^c. The curved portion 19 is provided at its opposite ends with upwardly extending flanges 19^a which are formed with openings to receive rods 21 to which latter are secured at regular spaced intervals guiding fingers 22. As shown in Fig. 5, the guiding fingers 22 are disposed substantially in parallel relation to the portion 19 so as to coact with the latter to effect the proper guiding of the sheets of paper from the apparatus as will be more fully described hereinafter.

Each tray is supported between the plates 15 and 15^a by a rod 23 which as shown in Fig. 3 extends through the slots 18^c with its opposite ends secured in the plates 15 and 15^a by nuts 24 as shown in Fig. 4. The tray is adjustable longitudinally by virtue of the slots 18^c, and are adapted to be locked in any adjusted position by means of a pair of plates 25 and a pair of bolts 26. As shown in Fig. 8, each plate 25 is provided with two openings through one of which extends the rod 23 and through the other, one of the

bolts 26. As shown in Fig. 6, each plate 25 is locked against longitudinal movement upon the rod 23 by a pair of nuts 27, the bolt 26 serving to lock the enlarged flange 18^b to the plate 25 whereby the tray as a unit is locked against movement. By this arrangement, it will be seen that each tray is adjustable within the length of the slots 18^c and that by tightening the bolts 26, the locking of the tray in any adjusted position can be readily effected.

Referring now to Figs. 2, 3 and 4, H', H^2, H^3 designate a plurality of shafts which are journaled in the plates 15 and 15^a so that they span the distance therebetween. Each shaft is provided with a plurality of feed rollers R arranged in pairs and secured to the shaft for rotation therewith by means of sleeves 28. In the present instance, the feed rollers R are formed of rubber and are provided at their peripheries with teeth 29 which are adapted to engage the surface of the sheets of paper for feeding the same from the several trays. As shown in Fig. 3, I provide one shaft H and one set of feed rollers R for each of the trays T', T^2 and T^3. The feed rollers R are disposed contiguous to the curved portions 20 of the trays so that when rotated in a clockwise direction as viewed in Fig. 3, a sheet of paper supported upon the trays will be fed forwardly and upwardly onto the curved portions 19. Each tray is biased by means of a coil spring 29 to a position wherein the curved portion 20 is forced upwardly toward the feed rollers R, it being understood that as the spring 29 is connected to the tray at one side of the rod 23 which is the pivot point of the tray, the forward end of the tray is forced upwardly. As shown in Fig. 3, the springs 29 are connected at one end to the plates 15 and 15^a and at their other end to the edges of the trays.

The mechanism for actuating the shafts H comprises, in the present instance, a master gear G fixed to a shaft 30 journaled in the plate 15. The gear G meshes with a pinion G' fixed to the adjacent end of the shaft H' and to a somewhat larger pinion G^2 fixed to the adjacent end of the shaft H^2. The pinion G^2 meshes with an idler G^4 which will in turn mesh with the pinion G^3 fixed to the end of a shaft H^3. As shown in Fig. 1, the shaft 30 and the shafts H', H^2, H^3, are provided at their outer ends with cranks D for effecting the rotation of any one of the shafts. By the arrangement of these gears, it is obvious that simultaneous rotation of the gears G', G^2 and G^3 can be effected which in turn rotates the several shafts H', H^2, H^3 in the same direction but at different speeds because of the ratio of the several gears. It will be understood that the shaft H^3 rotates at a greater speed than the shaft H^2 while the latter in turn rotates at a speed greater than the shaft H^3.

Referring now to Figs. 4 and 7, it will be seen that the gear G' is capable of being connected and disconnected to the shaft H' by a sleeve 31 interposed between the gear and shaft and keyed to the latter by a key 32 formed on the shaft and working within a slot (not shown) formed in the sleeve. The sleeve 31 carries a key 34 which is adapted to seat within a slot 35 formed in the gear G'. In the normal position of the sleeve 31, the key 34 is within the slot 35 so that the gear G' is locked to the shaft H' for rotation therewith. However, when the sleeve is moved outwardly by means of the corresponding handle D, the key 34 is moved out of engagement with the gear G' so that the rotation of the gear will not effect the rotation of the shaft. As shown in Fig. 8, the handle of the crank D is formed integral with the sleeve 31.

The purpose of this arrangement is to allow of the rotation of the shaft H' by means of the master gear G or independently thereof by means of the crank D, it being understood that when the gear G' is disengaged from the shaft, rotation of the master gear will be ineffective to rotate the shaft H'. The gears G^2 and G^3 are adapted to be connected to their respective shafts through similar mechanism, but in order to simplify the drawings I have only shown the gear G' connected in this manner. With the shafts H', H^2, H^3, rotatable simultaneously through the master gear G or independently of each other through their respective cranks D, it will be seen that the feed rollers of each shaft can be rotated in a similar manner so as to effect a feeding of paper from one or all of the trays.

In the operation of the apparatus, it is arranged with relation to the platen P in the manner shown in Fig. 1 with the delivery ends of the trays disposed above the platen. The paper to be fed to the platen is now placed in the several trays, the tray T' containing the sheets for the copy of a letter, the tray T^2 the carbon sheets, and the tray T^3 the original sheets. With all of the gears G', G^2 and G^3 operatively connected to their respective shafts, it will be seen upon rotation of the master gear G in the direction of the arrow in Fig. 1, the several sets of feed rollers R are rotated which causes their teeth to engage the uppermost sheet in each tray and to feed the same forwardly and outwardly at the forward ends of the trays, the portions 19 and the guide fingers 22 properly guiding the sheets downwardly to the rear of the platen P. When the several sheets of paper have been fed far enough to be engaged by the platen, P, the operator then rotates the platen in the usual manner

causing the further feeding of the sheets into proper position upon the platen. During this feeding operation, the springs 29 serve to bias the trays to such a position that the feed rollers will properly engage the uppermost sheet and thus feed the same from the trays. However, when the several sheets are gripped by the platen during rotation of the same, a downward pull is exerted upon the sheets causing a rocking of the tray about the rods 23 as a center so that the forward ends are moved downwardly against the tension of the springs 29. This movement of the trays causes the sheets of paper to disengage the feed rollers so that the sheets are free to be fed around the platen by the rotation of the same. After the sheets have been completely withdrawn from the trays, the springs serve to automatically return the trays to their normal positions wherein the feed rollers again engage the uppermost sheet in each tray so that upon again actuating the feed rollers, other sheets can be fed to the typewriter.

In the feeding of the several sheets to the platen P, it will be particularly noted that because of the various speeds at which the shafts H′, H², H³ are rotated, the sheet from the tray T′ is fed outwardly at a greater speed than the carbon sheet from the tray T², while the original sheet from the tray T³ is fed at the lowest speed. As a result of this feeding operation, the outer ends of the three sheets are introduced to the platen at one and the same time so that they will occupy corresponding positions upon the platen. It will be understood that after the sheets engage the platen the feeding operation is completed by rotation of the platen that the corresponding positions of the several sheets will be maintained and independently of the feeding apparatus.

Although I have herein shown and described only one form of paper feeding apparatus embodying my invention, it is to be understood that various modifications and changes may be made herein without departing from the spirit of the invention or the spirit and scope of the appended claims.

What I claim is:—

1. A paper feeding apparatus for typewriters comprising, a plurality of trays mounted for rocking movement independently of each other, feed rollers for each of the trays, means for biasing the trays toward said feed rollers, and means for actuating said rollers at different speeds.

2. A paper feeding apparatus for typewriters comprising, a plurality of trays mounted for independent rocking movement, feed rollers for each of the trays, means for biasing the trays toward said feed rollers, and means for actuating the said feed rollers simultaneously and at different speeds.

3. A paper feeding apparatus for typewriters comprising, a plurality of trays mounted for rocking movement independently of each other, a set of feed rollers for each of said trays, means for rotating one set of rollers independently of the other sets, and means for rotating all of said rollers simultaneously and at different speeds.

4. A paper feeding apparatus for typewriters comprising, a plurality of superposed trays mounted for rocking movement independently of each other and adjustable longitudinally, means for feeding sheets of paper from the trays, and means for actuating the last means.

5. A paper feeding apparatus for typewriters comprising, a plurality of superimposed trays mounted for rocking movement independently of each other, means for feeding sheets of paper from said trays, and means for biasing the trays toward said feeding means, each of said trays comprising a linear portion, an upwardly curved portion and a downwardly curved portion, guide fingers mounted adjacent the downwardly curved portion, and flanges formed on the linear portion for the purpose described.

6. A paper feeding apparatus for typewriters comprising, a frame, rods mounted in the frame, trays fulcrumed on said rods and adjustable longitudinally, means for locking the trays in adjusted position, feed rollers for each of the trays, and means for simultaneously actuating all of said feed rollers.

7. A paper feeding apparatus for typewriters, comprising, a frame, rods fixed to the frame, trays fulcrumed on said rods and adjustable longitudinally, means for locking the trays in adjusted position, feed rollers for each of the trays, means for biasing the trays toward said feed rollers, and means for actuating all of the feed rollers simultaneously or independently of each other.

8. A paper feeding apparatus for typewriters comprising, a tray, adjustable means for pivotally supporting the tray for rocking movement, feed rollers arranged above the tray, means for biasing the tray toward said feed rollers, and means for actuating the feed rollers.

9. A paper feeding apparatus for typewriters comprising, a tray mounted for rocking movement and including a linear portion, an upwardly curved portion and a downwardly curved portion, feed rollers arranged above the tray at a point adjacent the upwardly curved portion, means for biasing the tray so that the upwardly curved portion is moved toward the feed rollers, and means for actuating the feed rollers to effect a feeding of a sheet of paper from the linear portion to the downwardly curved portion.

10. A paper feeding apparatus for typewriters comprising, a tray including a linear portion upon which sheets of paper are

adapted to be placed, an upwardly curved portion at one end of the linear portion, and a downwardly curved portion connected to the upwardly curved portion, guide fingers arranged adjacent the downwardly curved portion, means for mounting the tray for rocking movement, feed rollers disposed above the upwardly curved portion of said tray, and means for actuating the feed rollers to effect a feeding of a sheet of paper from the linear portion across the curved portions and off of the tray.

WILLIAM CHARLES AVERY.