No. 803,582. PATENTED NOV. 7, 1905.

B. GUSTAFSON.

PAPER FEEDING MACHINE.

APPLICATION FILED AUG. 3, 1904.

2 SHEETS—SHEET 1.

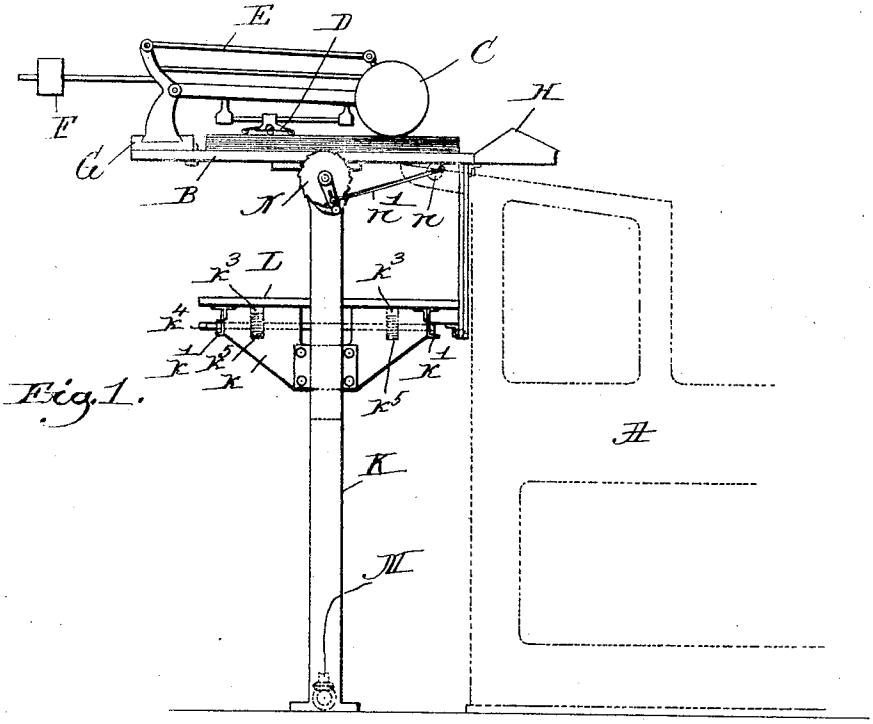
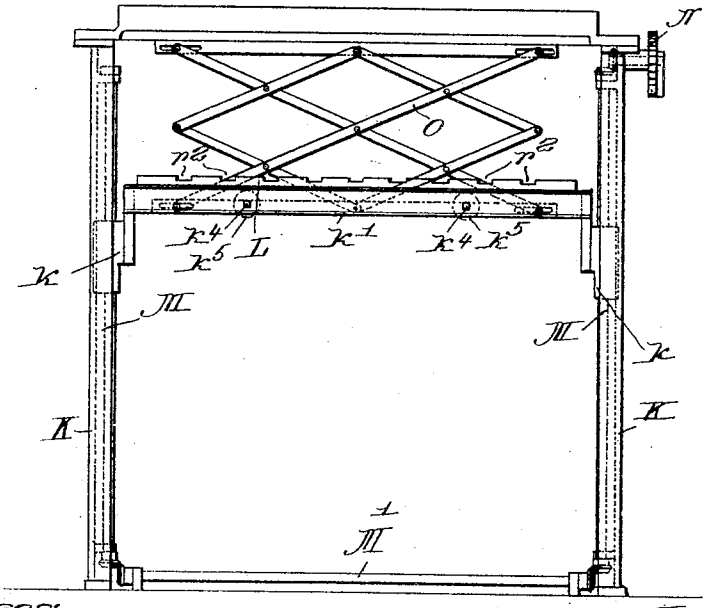


Fig. 1.

Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

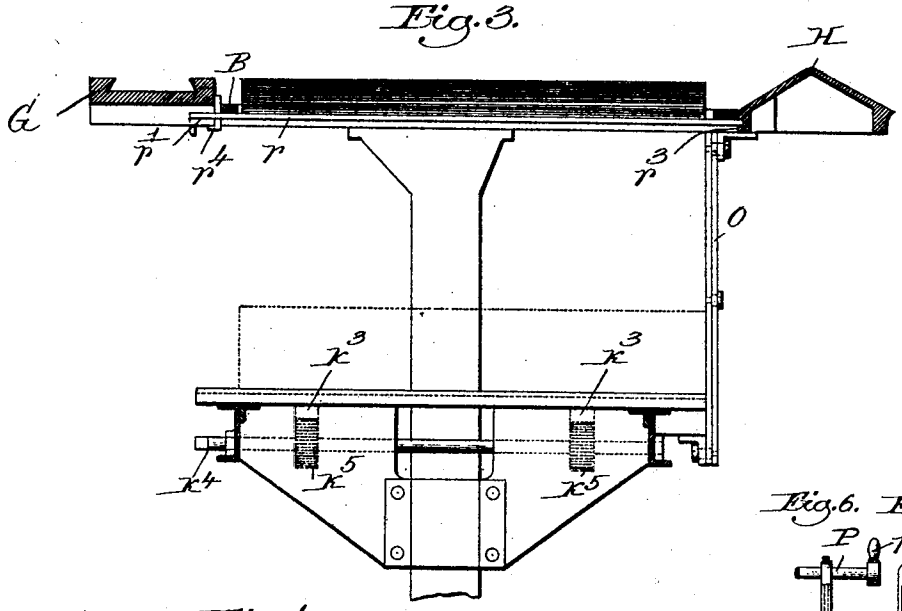


Fig. 6. Fig. 7.

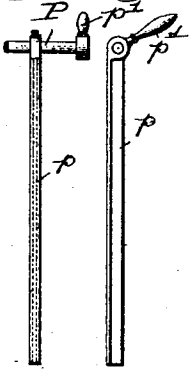


Fig. 4.

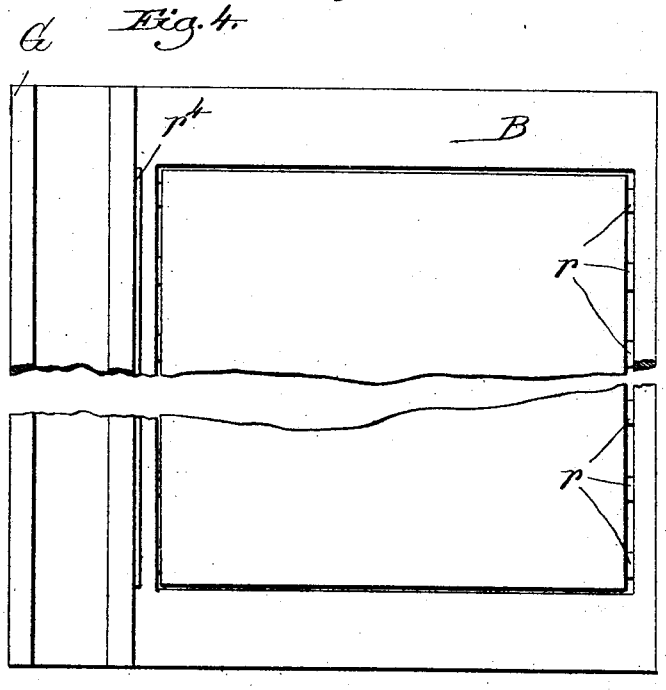
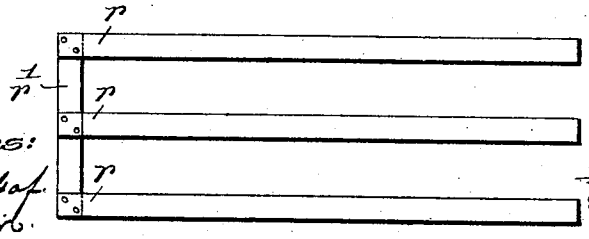


Fig. 5.



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UNITED STATES PATENT OFFICE.

BERNHARD GUSTAFSON, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED PRINTING MACHINERY COMPANY, A CORPORATION OF MAINE.

PAPER-FEEDING MACHINE.

No. 803,582. Specification of Letters Patent. Patented Nov. 7, 1905.

Application filed August 3, 1904. Serial No. 219,260.

To all whom it may concern:

Be it known that I, BERNHARD GUSTAFSON, a citizen of the United States, residing at Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Paper-Feeding Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to improvements in paper-feeding machines, and in particular to means for feeding the pile of sheets to the feeding-table.

The invention is particularly designed for use in connection with the paper-feeding apparatus shown and described in Patents No. 748,279, granted December 29, 1903, and No. 750,453, granted January 26, 1904, to E. J. Hallberg, and to some extent it is illustrated herein in connection with such an apparatus; but the invention is equally applicable to other forms of paper-feeding apparatus.

It is generally considered a desideratum in paper-feeding machinery where paper is fed in the form of sheets to obtain a continuous or practically continuous supply of sheets to the table from which the sheets are fed in order that the printing-press or other machine may be kept in constant operation and no time lost by stoppages of the machine for the purpose of replenishing the supply of sheets of paper.

Heretofore in that class of devices known as "pile-feeders," wherein the sheets are placed in a tall pile which is fed upwardly into the plane of the table from which the sheets are fed, it has been necessary when the pile has become exhausted or practically exhausted to stop the machine and lower the pile-carrying platform and then place thereon a new pile-supply.

It is the object of this invention in particular to make use of the principle of the pile-feeder and at the same time secure a continuous feed or supply of sheets to the table from which the sheets are fed. By making use of the pile-feeder principle the smallest possible space is utilized, for the pile-feeder can and must necessarily be placed directly beneath the table from which the sheets are fed, and hence it takes up no additional floor-space over that occupied by the original machine. Furthermore, the pile of sheets can be replenished from the floor or platform upon which the main machine rests, which is simplest and easiest for the workman and renders unnecessary any lifting or elevating of the sheets to an overhead table, as is usual and necessary in connection with the continuous-feed machines now in common use.

The drawings illustrate the preferred form of the invention, showing the pile-feeder set up in connection with the end of a printing-press frame and associated with a sheet-feeding apparatus, such as shown and described in the two patents to Hallberg above referred to.

Figure 1 of the drawings illustrate the pile-feeder in side elevation. The end of an ordinary printing-press frame is also shown in side elevation, and above the pile-feeder is shown a sheet-feeding apparatus in side elevation, such as shown in the two patents to Hallberg above referred to. Fig. 2 is an end elevation of the apparatus shown in Fig. 1. Fig. 3 is a side elevation, partially in cross-section and on a somewhat larger scale, of the upper portion of the apparatus shown in Fig. 1. Fig. 4 is a plan view of the apparatus shown in Fig. 1. Fig. 5 is a plan view of a portion of the grid to be described, and Figs. 6 and 7 represent a modified construction of guiding device hereinafter described.

A represents the rear portion of an ordinary printing-press frame.

B represents the table from which the sheets of paper are fed and corresponds to the table shown in Patents Nos. 750,453 and 748,279, except that herein it is shown with its central portion removed or cut away to allow the pile of sheets to pass up through and protrude above the table.

C represents the comb-wheel, D the presser, E the parallelogram frame, on which the presser and comb-wheel are mounted, and F the counterbalance for said frame, all these parts being shown substantially as in the said Patent No. 750,453.

At the end of the table B is shown a grooved guideway G, in which the sheet-feeding apparatus C D E F is mounted so as to be adjustable laterally of the table B.

At the forward end of the table B is shown the incline H for causing the separation of the sheets, such as is described in the aforesaid patent, No. 748,279.

The parts above described all form no part

of the present invention, but are all preferably used in connection therewith. The sheet-feeding apparatus of the Hallberg patent, No. 750,453, is particularly desirable, for the reason that owing to the parallelogram arrangement of supporting-frame the comb-wheel and presser retain their operative positions with respect to the sheets no matter what be the height of the pile above the table B.

The pile-feeder by which the continuous supply of sheets is kept up in the preferred form is constructed as follows: K K are two supports placed at opposite sides of the feeding-table and extending from the floor upwardly to the table. These supports or their equivalents are, in fact, needed for the support of the feeding-table B. A pile-carrying platform L is mounted on the supports K so as to move vertically up and down thereon. In the construction herein shown a bracket k is slidingly mounted on each support, and channel-beams k' serve to connect these brackets. The pile-carrying platform proper rests on the channel-beams k' and is movable laterally thereon.

The lateral movement of the pile-carrying platform on its support is for the purpose of adjustment in order that the pile may be slightly adjusted with respect to the feeding-table or the feeding apparatus. As a means for securing this lateral adjustment racks k^3 are shown attached to the lower surface of the platform L, and a shaft k^4, provided with gears k^5, meshing with the racks k^3, is shown journaled in the channel-beams k'.

Vertical movement may be given to the pile-carrying platform in any desired manner; but it should, of course, be gradual and steady and should harmonize with the speed of the sheet-feeding apparatus. I have herein illustrated for this purpose two vertical worm or screw shafts M M, one at each support K, and threaded into the respective brackets k. These shafts are connected at the bottom by means of bevel-gears with the horizontal shaft M'. One of the vertical shafts is shown as driven by a pawl-and-ratchet mechanism N through the medium of bevel-gears. The pawl-and-ratchet mechanism is shown as driven from an eccentric n, which in turn receives its motion from any suitable mechanism in the press or other machine. The rod n', connecting the eccentric with the pawl, may be adjustable in the arm of the pawl, so as to secure variations in speed, or these variations may be secured in any other desired manner.

When it is desired to lower the pile-carrying platform, the pawl-and-ratchet mechanism N may be disconnected and the screw-shaft M operated by hand, or a suitable connection may be made with the machine for giving a reverse rotation to this shaft.

It is important, if not necessary, to have a guide for at least one vertical surface, and preferably the front vertical surface, of the pile of sheets on the platform. For this purpose I have shown a guide O, which consists of a lazy-tongs device, connected at its upper end with a fixed portion of the machine—as, for example, the sheet-feeding table—and at its lower end with the movable pile-carrying platform. It will thus be seen that whatever be the position of the pile-carrying platform the guide O will present a vertical surface to the front edge of the pile of sheets on the platform.

Various devices may be used for guiding the pile of sheets, and as a modification I have shown in Figs. 6 and 7 a guiding device which consists of a horizontal shaft P, provided with a series of adjustable vertical guiding-bars p. This shaft may be mounted in a fixed portion of the machine, such as the sheet-feeding table, with the guides p depending vertically and of a sufficient length to guide the pile. When it is desired to get the pile out of the way, the shaft P may be turned by a handle p' so as to swing the guiding-bars p up under the frame of the printing-press or other machine.

When a pile of sheets is placed upon the pile-carrying platform L and the pawl-and-ratchet mechanism is set in motion, the pile of sheets is gradually fed upwardly, and the sheet-feeding apparatus will act to feed off the sheets one by one to the printing or other machine. When the pile is nearly exhausted, the pile-carrying platform is of course in its uppermost position, and in order to replenish the pile the pile-carrying platform must be lowered and a new pile of sheets placed thereon. I provide means to hold the nearly-exhausted pile of sheets in position at the sheet-feeding table while the pile-carrying platform is being lowered, replenished, and brought into feeding position. This means is herein shown to consist of what I have termed for convenience a "grid." This grid preferably comprises one or more series of bars r r, connected at one end by a cross-bar r'. The pile-carrying platform is grooved or cut away at r^2 sufficiently to allow the bars of the grid to rest therein without protruding above the surface of the platform.

The framework of the machine preferably in about the plane of the sheet-feeding table B is provided with slots r^4 and grooves r^3 to receive and sustain the grid preparatory to lowering the platform, the slots receiving the ends of the grid when being inserted in operative position, the ends of the grid entering the grooves. In the operation of this device when the pile-carrying platform has reached an uppermost position and the pile of sheets is nearly exhausted the grooves r^2 in the platform come in line with the slots r^4 and the groove r^3 in the sheet-feeding table. The grid is then slipped in, the cross-bars of the grid passing through the slots r^4, through

the grooves 7^2 in the platform, and entering the groove 7^3 in the table. Now when the platform is lowered the grid remains, forming a support for a sufficient portion of the pile of sheets to supply the sheet-feeding apparatus until the pile-carrying platform can be replenished with a new pile of sheets and raised into position, when the grid can be withdrawn and the feeding of the pile continued as before. It will thus be seen that the feed of the pile of sheets is continuous, for before the pile is entirely exhausted it is replenished at the bottom. Hence the sheet-feeding apparatus can be run continuously, and it is unnecessary to stop the machine to replenish the pile of sheets.

While I have shown the grid as supported by slots and a groove in the sheet-feeding table, these matters form no essential part of the invention, for it is obvious that all that is necessary is to provide a device which can be slipped beneath the partially-exhausted pile and hold it in position while the pile-carrying platform is lowered, replenished, and brought into position.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A sheet-pile feeder comprising a vertically-movable pile-carrying platform, means for gradually raising said platform to place and maintain the upper end of the pile in delivery position until the pile is partially exhausted, means located between the pile and said platform and adapted to be sustained by a fixed portion of the machine, whereby the partially-exhausted pile may be held in elevated position while the said platform is withdrawn from beneath the partially-exhausted pile.

2. A sheet-pile feeder comprising a vertically-movable pile-carrying platform, means for gradually raising said platform to place and maintain the upper end of the pile in delivery position until the pile is partially exhausted, means adapted to be placed temporarily between the pile and said platform and sustained by a fixed portion of the machine, whereby the partially-exhausted pile may be held in elevated position while the said platform is withdrawn from beneath the partially-exhausted pile.

3. A sheet-pile feeder comprising a vertically-movable pile-carrying platform, means for gradually raising said platform to place and maintain the upper end of the pile in delivery position until the pile is partially exhausted, means located between the pile and said platform but below the surface of said platform and adapted to be sustained by a fixed portion of the machine, whereby the partially-exhausted pile may be held in elevated position while the said platform is withdrawn from beneath the partially-exhausted pile.

4. A sheet-pile feeder comprising a vertically-movable pile-carrying platform, means for gradually raising said platform to place and maintain the upper end of the pile in delivery position until the pile is partially exhausted, means adapted to be placed between the pile and said platform but below the surface of said platform and sustained by a fixed portion of the machine, whereby the partially-exhausted pile may be held in elevated position while the said platform is withdrawn from beneath the partially-exhausted pile.

5. A sheet-pile feeder comprising a vertically-movable pile-carrying platform, means adapted to be slipped beneath the partially-exhausted pile in its elevated position and connected with a fixed portion of the machine, whereby the platform may be withdrawn from beneath the partially-exhausted pile.

6. A sheet-pile feeder comprising a vertically-movable pile-carrying platform, a grid adapted to be slipped beneath the partially-exhausted pile in its elevated position and connected with a fixed part of the machine, whereby the platform may be withdrawn from beneath the partially-exhausted pile.

7. A sheet-pile feeder comprising a vertically-movable pile-carrying platform, a grid located between the pile and said platform, but below the surface of said platform, and adapted to be connected with a fixed part of the machine, whereby the platform may be withdrawn from beneath the partially-exhausted pile.

8. A sheet-pile feeder comprising a vertically-movable pile-carrying platform, longitudinal grooves in the upper surface of the said platform, bars adapted to be slipped in the said grooves beneath the partially-exhausted pile in its elevated position and connected with a fixed portion of the machine, whereby when the platform is withdrawn from beneath the partially-exhausted pile the said pile will be supported by the bars.

9. A sheet-pile feeder comprising a vertically-movable pile-carrying platform, longitudinal grooves in the upper surface of the said platform, bars connected to form a grid and adapted to be slipped in the said grooves beneath the partially-exhausted pile in its elevated position and connected with a fixed portion of the machine, whereby when the platform is withdrawn from beneath the partially-exhausted pile the said pile will be supported by the grid.

10. A sheet-feeding table, a sheet-pile feeder located beneath the said sheet-feeding table and comprising a pile-carrying platform, means for giving vertical movement to the pile-carrying platform, an aperture in the sheet-feeding table to allow of the passage of a pile of sheets upward therethrough, means to hold a partially-exhausted pile of sheets in feeding position above the sheet-feeding table while the pile-carrying platform is withdrawn from beneath the partially-exhausted pile.

11. A sheet-feeding table, a sheet-pile feeder located beneath the said sheet-feeding table and comprising a pile-carrying platform, means for giving vertical movement to the pile-carrying platform, an aperture in the sheet-feeding table to allow of the passage of a pile of sheets upward therethrough, means to hold a partially-exhausted pile of sheets in feeding position above the sheet-feeding table while the pile-carrying platform is withdrawn from beneath the partially-exhausted pile, and a sheet-feeding apparatus located on the sheet-feeding table and resting upon the pile of sheets.

12. A sheet-feeding table, a sheet-pile feeder located beneath the said sheet-feeding table and comprising a pile-carrying platform, means for giving vertical movement to the pile-carrying platform, an aperture in the sheet-feeding table to allow of the passage of a pile of sheets upward therethrough, means to hold a partially-exhausted pile of sheets in feeding position above the sheet-feeding table while the pile-carrying platform is withdrawn from beneath the partially-exhausted pile, and a sheet-feeding apparatus located on the sheet-feeding table and resting on and supported by the pile of sheets.

13. A sheet-feeding table, a sheet-pile feeder located beneath the said sheet-feeding table and comprising a pile-carrying platform, means for giving vertical movement to the pile-carrying platform, an aperture in the sheet-feeding table to allow of the passage of a pile of sheets upward therethrough, means removably connected with the sheet-feeding table and adapted to hold the partially-exhausted pile of sheets in feeding position above the sheet-feeding table while the pile-carrying platform is withdrawn from beneath the partially-exhausted pile.

14. A sheet-feeding table, a sheet-pile feeder located beneath the said sheet-feeding table and comprising a pile-carrying platform, means for giving vertical movement to the pile-carrying platform, an aperture in the sheet-feeding table to allow of the passage of a pile of sheets upward therethrough, means to hold a partially-exhausted pile of sheets in feeding position above the sheet-feeding table while the pile-carrying platform is withdrawn from beneath the partially-exhausted pile, and a guide for the forward edge of the pile of sheets.

15. A sheet-feeding table, a sheet-pile feeder located beneath the said sheet-feeding table and comprising a pile-carrying platform, means for giving vertical movement to the pile-carrying platform, an aperture in the sheet-feeding table to allow of the passage of a pile of sheets upward therethrough, means to hold a partially-exhausted pile of sheets in feeding position above the sheet-feeding table while the pile-carrying platform is withdrawn from beneath the partially-exhausted pile, and a collapsible guide for the front edge of the pile of sheets.

16. A sheet-feeding table, a sheet-pile feeder located beneath the said sheet-feeding table and comprising a pile-carrying platform, means for giving vertical movement to the pile-carrying platform, an aperture in the sheet-feeding table to allow of the passage of a pile of sheets upward therethrough, means to hold a partially-exhausted pile of sheets in feeding position above the sheet-feeding table while the pile-carrying platform is withdrawn from beneath the partially-exhausted pile, and a collapsible guide for the front edge of the pile of sheets connected at its upper end to the frame of the machine and at its lower end to the pile-carrying platform.

17. A sheet-feeding table, a sheet-pile feeder located beneath the said sheet-feeding table and comprising a pile-carrying platform, means for laterally adjusting said pile-carrying platform, an aperture in the sheet-feeding table to allow of the passage of a pile of sheets upward therethrough, means to hold a partially-exhausted pile of sheets in feeding position above the sheet-feeding table while the pile-carrying platform is withdrawn from beneath the partially-exhausted pile.

18. A sheet-feeding table, a sheet-pile feeder located beneath the said sheet-feeding table and comprising a pile-carrying platform provided with grooves therein, means for giving vertical movement to the pile-carrying platform, an aperture in the sheet-feeding table to allow of the passage of a pile of sheets upward therethrough, bars adapted to be slipped within the said grooves in the pile-carrying platform and removably connected to the sheet-feeding table in order to hold the partially-exhausted pile of sheets in feeding position above the sheet-feeding table while the pile-carrying platform is withdrawn from beneath the partially-exhausted pile.

19. A sheet-feeding table, a sheet-pile feeder located beneath the sheet-feeding table and comprising a sheet-carrying platform in its upper surface, means for giving vertical movement to the pile-carrying platform, an aperture in the sheet-feeding table to allow of the passage of a pile of sheets upward therethrough, a grid comprising a series of connected bars adapted to be slipped into the grooves in the pile-carrying platform and to be connected with the sheet-feeding table, whereby the partially-exhausted pile of sheets may be held in feeding position above the sheet-feeding table while the pile-carrying platform is withdrawn from beneath.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BERNHARD GUSTAFSON.

Witnesses:
CARL P. GERELL,
ERNST HALLBERG.