

United States Patent

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[54] **SHEET FEED DEVICE FOR PRINTING MACHINES AND THE LIKE**

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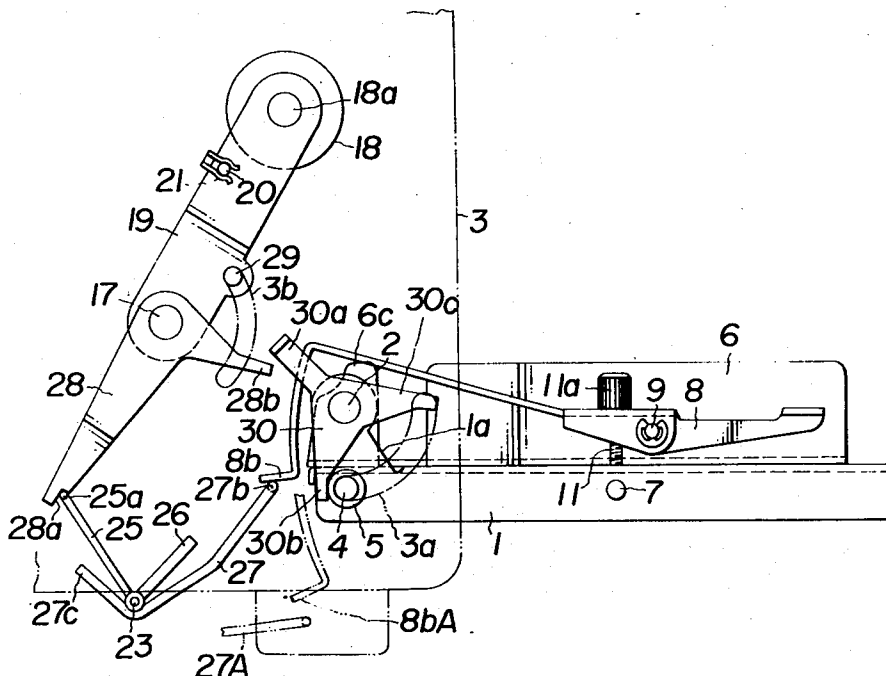
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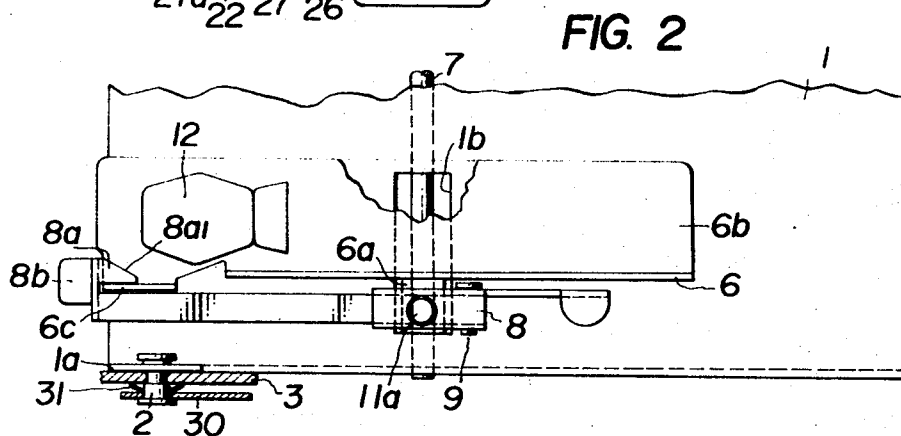
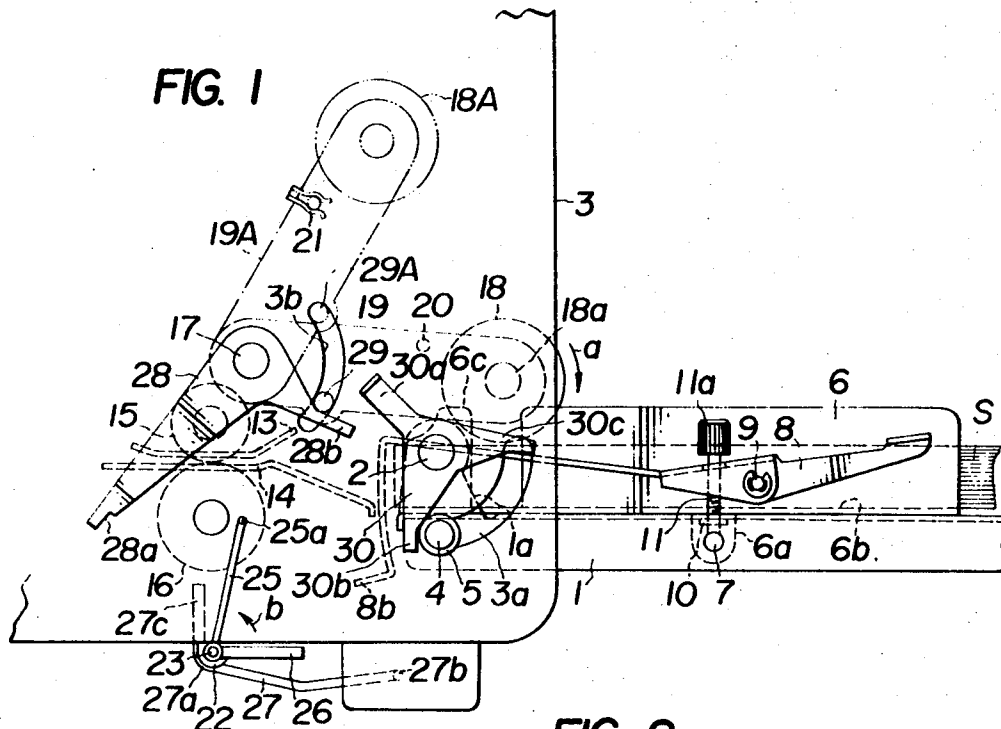
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[57] ABSTRACT

A pair of sheet hold-down members, provided with respective sheet-engaging pawls, are moved upward simultaneously upon actuation of a lifting member automatically held in its operative position by holding means. The holding means are released, to permit movement of the lifting member to an inoperative position, responsive to movement of a sheet feed roller from a lifted inoperative position downwardly into engagement with a stack of sheets. If the sheet feed device has a retractable sheet feed tray, the holding means for the lifting member is released responsive to movement of the tray to its retracted position, for movement of the lifting member to its inoperative position.

10 Claims, 6 Drawing Figures





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FIG. 5

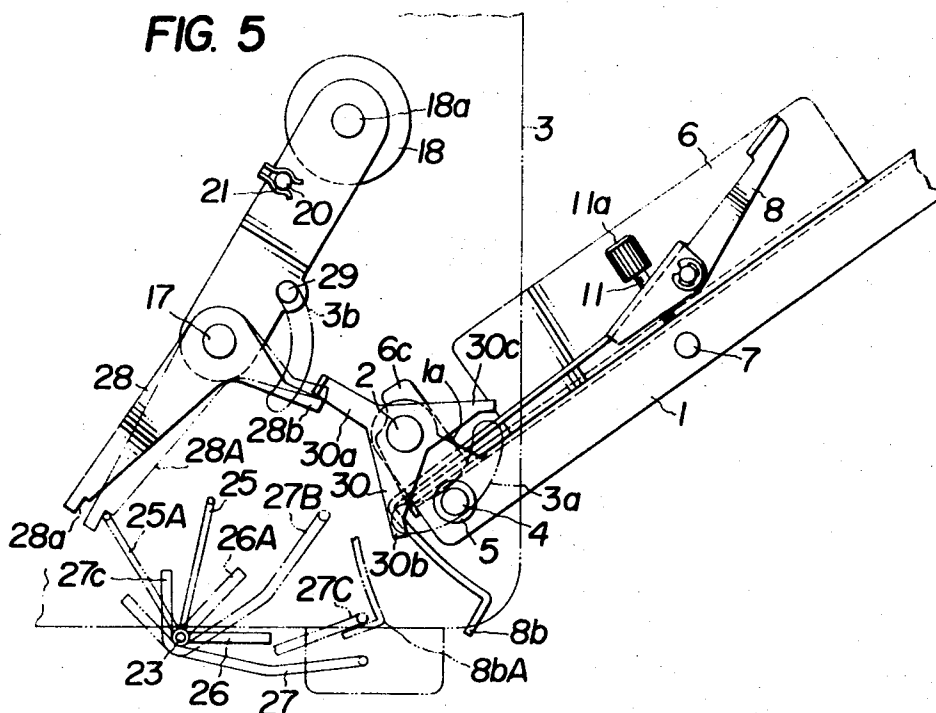
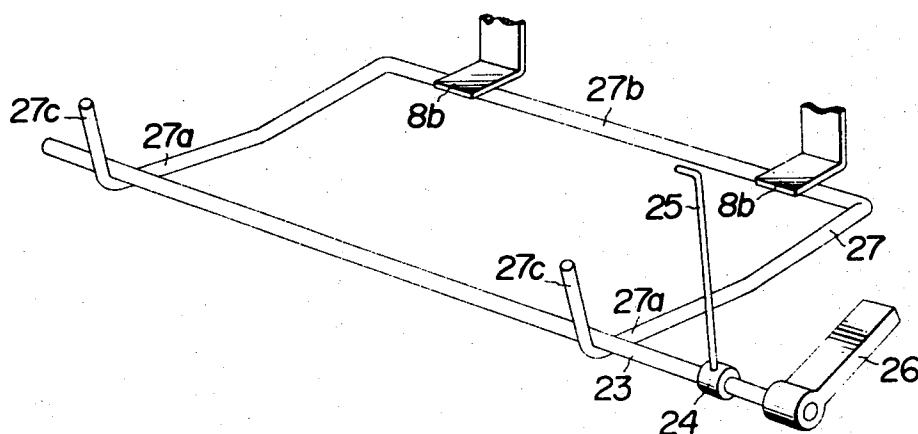


FIG. 6



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SHEET FEED DEVICE FOR PRINTING MACHINES AND THE LIKE

BACKGROUND OF THE INVENTION

Sheet feed devices, for printing machines, copying machines, and the like, are provided with sheet hold-down members having pawls for engaging and holding down the front corners of master plates, copy sheets, photosensitive sheets and the like, which are hereinafter referred to as sheets, and which are piled in a stack on a sheet feed tray, in order that the sheets may be fed positively and smoothly. More specifically, when a sheet feed roller is pressed downwardly against sheets piled in a stack on a sheet feed tray, and rotated in a direction to feed the sheets, the uppermost sheet, which has its leading edge held down by the pawls of the sheet hold-down members, is pushed, at its rear portion, by the sheet feed roller so that the sheet bulges upwardly. As a result, the uppermost sheet is released from engagement with the pawls due to its own resilience, and is fed by the feed roller. This cycle of operation is repeated, so that single sheets are fed one after another positively and smoothly.

When all of the sheets on the tray have been fed by the feed roller, it is necessary to stack a new supply of sheets on the feed tray. At this time, the sheet feed roller and the pawls of the sheet hold-down members still are engaged with the tray, so that these members must be moved to their upper or retracted positions when the tray is to be supplied with another stack of sheets. Generally, the sheet hold-down members are mounted separately on opposite sides of the sheet feed tray. Thus, the operator is required to use both hands to move the sheet hold-down members to their retracted positions while he is required, on the other hand, to move the sheet feed roller to its upper position, when a fresh supply of sheets is placed on the tray. The operation of supplying a fresh stack of sheets to the tray therefore has been troublesome and time consuming.

SUMMARY OF THE INVENTION

This invention relates to sheet feed devices, for printing machines, copying machines, and the like and, more particularly, to an improved and simplified means greatly facilitating placing a fresh stack of sheets on a sheet feed tray by retaining sheet hold-down members and a sheet feed roller in an upper retracted position in a simple and positive manner.

The objective of the invention is to provide a sheet feed device in which a pair of sheet hold-down members, having respective pawls, can be moved upwardly simultaneously and held in their upper retracted positions, and can be automatically moved downwardly to their lower operative positions responsive to downward movement of a sheet feed roller, or when a sheet feed tray is moved to its upper or retracted position, when a retractable sheet feed tray is provided on the machine.

In accordance with the invention, a pair of these sheet hold-down members are moved simultaneously upwardly by a lifting member which is automatically retained in its upper or operative position by holding means. This holding means is automatically released, to permit the lifting member to move to its lower or inoperative position, responsive to movement of a sheet feed roller to its operative position in engagement with a stack of sheets. Alternatively, the lifting member is

released by the holding means responsive to movement of a retractable sheet feed tray to its retracted position.

A sheet feed device embodying the invention permits readily supplying the sheet feed tray with a fresh stack of sheets without any trouble. It is possible, with the device of the invention, to bring the sheet hold-down members, having the pawls, into engagement with the sheets simultaneously with movement of the sheet feed roller into pressing engagement with the stack of sheets on the tray. In the present invention, the lifting member is brought to its lower, or inoperative, position whenever the sheet feed tray is moved to its retracted position. With this arrangement, the difficulty of being unable to move the sheet hold-down members upwardly when the sheet feed tray is brought to its operative position in the next cycle of operation can be eliminated.

An object of the invention is to provide an improved sheet feed device for printing machines, copying machines and the like.

Another object of the invention is to provide such a sheet feed device in which the sheet hold-down members are moved upwardly simultaneously by a lifting device which is then releasably held in its operative position.

A further object of the invention is to provide such a sheet feed device in which the lifting member is automatically released from its operative position responsive to movement of a sheet feed roller downwardly to engage a stack of sheets on a sheet feed tray.

Another object of the invention is to provide such a sheet feed device in which the lifting member is automatically released, for movement to its inoperative position, responsive to movement of a retractable sheet feed tray to its retracted position.

For an understanding of the principles of the invention, reference is made to the following description of a typical embodiment thereof as illustrated in the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

In the Drawing:

FIG. 1 is a side elevation view of a sheet feed device, for printing means and the like, constituting one embodiment of the present invention;

FIG. 2 is a partial plan view illustrating the left half of a sheet feed tray, as viewed in the sheet feeding direction;

FIGS. 3, 4 and 5 are side elevation views illustrating the manner of operation of the sheet feed device shown in FIG. 1; and

FIG. 6 is a perspective view of the sheet hold-down members and the lifting member, showing the relative positions as the sheet hold-down members are moved upwardly by the lifting member.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring first of FIG. 1, a sheet feed section of a printing machine or the like has a sheet feed tray 1 provided, on opposite edges of its front end, with a pair of upright members or ears 1a apertured to receive a mounting shaft 2 connected to a pair of side walls 3 of the sheet feed section, so that tray 1 can pivot about the axis of shaft 2. A shaft 4 extends through the lower por-

tions of the upright members 1a, and side walls 3 have arcuate slots 3a each being a circular arc centered on shaft 2. The opposite ends of shaft 4 are slidably received in slots 3a, and collars 5 are firmly secured to each end of shaft 4.

Sheet feed tray 1 is so constructed that it can be pivoted about the axis of shaft 2 between the operative, or sheet feeding, position shown in FIG. 1 and an inoperative, or retracted, position shown in FIG. 4, by manually moving tray 1 between these two positions. Slots 3a have an arcuate length sufficient to permit tray 1 to move between the two predetermined positions thereof.

A pair of side plates 6 are provided on the upper surface of tray 1, and include mounting members 6a having apertured bent depending portions extending through transversely directed slots 1b (FIG. 2), formed in the central portion of the bottom of tray 1, and fitted loosely over a guide rod 7 firmly secured at its opposite ends to feed tray 1. A pair of sheet hold-down members 8, having respective pawls 8a (FIG. 2) at their forward ends, are pivotally mounted by pivots or pins 9 on opposite sides of side plates 6. The forward end of each hold-down member 8 is bent downwardly, as shown in FIG. 1, to form a foot 8b. An internally threaded member 10 is firmly secured to the underside of the horizontal portion of each mounting member 6a to threadedly receive a headed screw 11 extending downwardly and loosely through an opening formed in each sheet hold-down member 8.

Sheets S are placed on feed tray 1 by being positioned on the horizontal portion 6b of side plates 6. Each time a fresh supply of sheets S is placed on tray 1, side plates 6 are adjusted laterally relative to each other along guide rod 7 within the limits permitted by slots 1b, so as to effect adjustment of the position of sheets S which are piled in a stack. When the sheets are disposed in a predetermined position, a head 11a of each screw 11 is turned so as to thread screw 11 downwardly until its forward end abuts against guide rod 7. When the screws 11 are brought into abutment with guide rod 7, side plates 6 are firmly secured and sheets S are held by side plates 6 in the predetermined position.

A rubber plate 12, as best seen in FIG. 2, is provided toward the forward end of the horizontal portion 6b of each side plate 6, for preventing slipping of sheets S on tray 1. Furthermore, an upright wall 6c is provided on such forward end of each side wall 6 and is disposed laterally outwardly of side plates 6, as best seen in FIG. 2. Pawls 8a are adapted to move upwardly and downwardly along upright walls 6c. The disclosed arrangement, in which upright walls 6c are disposed outwardly of side plates 6, makes it possible to feed the sheets smoothly by bringing inclined edges 8a₁, as shown in FIG. 2, of pawls 8a into engagement with opposite side edges of sheets S when these are held down at the two front corners by pawls 8a.

Upper and lower guide plates 13 and 14, respectively, are disposed forwardly of tray 1 in the sheet feed section, and delivery rollers 15 and 16 press against each other and are disposed substantially in the central portion of the sheet feed section. A support shaft 17 is connected to side walls 3 in a position above and to the right of roller 15, as viewed in FIG. 1. Shaft 17 loosely

mounts support arms 19 for a sheet feed roller 18 mounted on a support shaft 18a supported in arms 19, and connected by suitable means to a drive mechanism (not shown) so that feed roller 18 may be rotated in the direction of the arrow a of FIG. 1 when sheets S are fed. Support arms 19 are moved to the dash and dot line positions 19A, shown in FIG. 1, so as to move sheet feed roller 18 to a dash and dot line position 18A shown in FIG. 1, when sheet feed tray 1 is moved upwardly to its inoperative or retracted position as shown in FIG. 4, or when a fresh supply of sheets is placed on tray 1 or the stack of sheets thereon is replaced by another stack of sheets, while the tray 1 remains in its operative of sheet feed position as illustrated in FIG. 1. A pin 20 is secured to that support arm 19 disposed nearer the plane of FIG. 1, and a locking clip 21 is secured to the inner surface of the adjacent side wall 3 in a position which corresponds to the position of pin 20 when support arms 19 are moved to their upper position. Thus, pin 20 is releasably received in and locked by clip 21 when support arms 19 are moved to their upper positions, whereby sheet feed roller 18 and support arms 19 can be locked in their upper positions.

When sheets S are placed on sheet feed tray 1 disposed in its operative or sheet feeding position, as shown in FIG. 1, and pawls 8a of hold-down members 8 engage the two front corners of sheets S while sheet feed roller 18 engages the upper surface of the uppermost sheet at a position forwardly of its central portion, pawls 8a and roller 18 press against sheets S by their own weight, so that the sheets S are ready to be fed. Upon receipt of a command to start sheet feeding, feed roller 18 rotates in the direction of arrow a and moves the upper most sheet S forwardly in cooperation with pawls 8a. The sheet, thus moved forwardly, is passed between guide plates 13 and 14 and fed between delivery rollers 15 and 16, so that the sheet may be delivered to the printing section, if the machine is a printing machine, or to the exposure section, if the machine is a duplicating machine. Sheets S on tray 1 are gradually reduced in number as they are fed singly to the section in which they are treated and, as the sheets decrease in number, pawls 8a and feed roller 18 move downwardly until they are brought into engagement with the bottom wall of feed tray 1 when there are no sheets thereon. The position of foot 8b of one member 8, when pawl 8a engages the bottom wall of tray 1, is shown in dash and dot line at 8bA in FIG. 3. When all the sheets S on tray 1 have been fed, sheet feed roller 18 is first moved to its upper position 18A shown in FIG. 1.

On the underside of the frame and disposed beneath delivery roller 16, on both sides of the frame, there are depending support members 22 loosely supporting a shaft 23. Near that end of shaft 23 nearer to the plane of FIG. 1, an engaging arm 25 is secured to the shaft through the medium of a collar 24, as shown in greater detail in FIG. 6, and an externally accessible operation arm 26 is secured to the end of shaft 23. A substantially u-shape lifting member 27 has its legs 27a secured to shaft 23, as by welding, brazing, or the like, and its bight 27b is disposed beneath feet 8b of hold-down members 8. The length of bight 27b is sufficient that it is disposed beneath feet 8b when the lateral distance between these feet is at its maximum as side plates 6 are separated laterally the maximum possible distance.

Lifting member 27 normally is disposed in its lower or inoperative position shown in FIG. 1, but can be moved to its upper or operative position by operating arm 26 from the exterior of the machine, to turn this arm in the direction of the arrows *b* of FIG. 1 so as to angularly displace member 27 about the axis of shaft 23. If arm 26 is turned in the direction of arrow *b*, lifting member 27, then disposed in its lower position 27A shown in dash and dot lines in FIG. 3, will move to the solid line position shown in FIG. 3. Thereby, feet 8*b* of hold-down members 8 are moved from the dash and dot line positions 8*b*A of FIG. 3 to the solid line positions of FIG. 3, while pawls 8*a* of members 8 disengage the bottom wall of sheet feed tray 1.

A locking lever 28 is loosely mounted at that end of shaft 17 nearer to the plane of FIG. 1, this being the shaft supporting support arms 19 for sheet feed roller 18. Engaging arm 25 has a bent engaging portion 25*a* at its upper end which is adapted to come into engagement with a locking notch 28*a* at the end of one arm of lever 28, when lifting member 27 is moved upwardly to its upper or operative position shown in FIG. 3. Thereby, lifting member 27 can be held in its upper operative position, so that pawls 8*a* are moved upwardly and remain clear of tray 1, as shown in FIG. 3, to permit loading another stack of sheets on tray 1.

A pin 29 on the support arm 19, for feed roller 18, disposed nearer to the plane of FIG. 1, projects outwardly through an arcuate slot 3*b* formed in the adjacent side wall 3, this arcuate slot being centered on the axis of shaft 17. The other arm 28*b* of lever 28 is disposed in the path of movement of pin 29.

Pin 29 does not interfere with the operation of locking lever 28 when sheets *S* are placed on tray 1, because feed roller 18 is disposed in its upper position shown in FIG. 3, as mentioned. However, when a stack of sheets *S* is placed in a predetermined position on sheet feed tray 1, and roller 18 is moved downwardly into engagement with the uppermost sheet to be ready for a cycle of sheet-feeding, pin 29 moves from its upper position shown in FIG. 3, and which is the dot and dash line position 29A shown in FIG. 1, to its solid line position, as shown in FIG. 1, along slot 3*b*. At the terminal stage of its movement, pin 29 engages arm 28*b* of lever 28 locking engaging arm 25, and moves this arm clockwise about the axis of shaft 17, thereby releasing locking lever 28 from locking engagement with engaging arm 25.

Upon release of the locking engagement of arm 28 with engaging member 25, lifting member 27 moves downwardly by its own weight to its lower position shown in FIG. 1, and which is the dot and dash line position 27A of FIG. 3. Accordingly, pawls 8*a* of hold-down members 8 move downwardly, by their own weight, into pressing engagement with the sheets *S* stacked on tray 1. Base portions 27*c* of the arms of the U-shaped lifting member 27 are bent upwardly, as best seen in FIG. 6, so that the range of pivotal movement of member 27 can be restricted by inhibiting movement of base portions 27*c* by engagement with suitable stops.

Locking lever 28 is pushed downwardly by pin 29 at all times while the sheet feed roller 18 is in its operative or sheet feeding position. However, if roller 18 is moved upwardly to its inoperative position, lever 28 is released from engagement with pin 29 and pivots counterclockwise about the axis of shaft 17 by its own

weight, so that locking member 28 can lock engaging arm 25 of lifting member 27.

A locking release lever 30 is pivotally mounted at that end of shaft 2, mounting tray 1, which is disposed nearer to the plane of FIG. 1, and a frictional force of a low order is imparted to lever 30 by a leaf spring 31, as best seen in FIG. 2. Lever 30 has three arms 30*a*, 30*b* and 30*c*. Arms 30*b* and 30*c* are disposed on opposite sides of shaft 4, and spaced from each other a distance slightly smaller than the range of movement of shaft 4 along slots 3*a*. If tray 1 is brought to its sheet feeding position shown in FIG. 1, shaft 4 pivots clockwise about the axis of shaft 2, so that arm 30*b* is pushed and moved by collar 5 and lever 30 is pivoted clockwise about shaft 2. The bent end portion of arm 30*a*, which is disposed in a position corresponding to the position of arm 28*b* of locking lever 28, moves away from arm 28*b* when lever 30 pivots clockwise. FIG. 1 shows the sheet feed device embodying the invention in this state.

Upon completion of feeding of sheets *S* on tray 1, the tray is moved upwardly, as mentioned and as shown in FIG. 4, into its inoperative or retracted position. When tray 1 is moved to its retracted position, feed roller 18 is first moved to its upper position and then hold-down members 8 are moved upwardly as lifting member 27 is moved to its upper position, in case there are some sheets left on tray 1, so as to permit the operator to remove these sheets from tray 1. FIG. 3 shows the sheet feed device embodying the invention in this state.

If tray 1 is moved upwardly from the state shown in FIG. 3, shaft 4 pivots counterclockwise about shaft 2, and collar 5 pushes and moves arm 30*c* of locking release lever 30, so that lever 30 pivots counterclockwise about shaft 2. Thereby, bent end portion of arm 30*a* of lever 30 pushes and moves arm 28*b* of lever 28, and pivots lever 28 clockwise about shaft 17. This releases locking lever 28 from locking engagement with engaging arm 25, so that lifting member 27 moves downwardly from its upper operative position to its lower inoperative position and the parts occupy the state shown in FIG. 4.

The provision of locking release lever 30 for moving lifting member 27 downwardly from its upper operative position to its lower inoperative position upon movement of feed tray 1 to its inoperative retracted position is effective to prevent failure of lifting member 27 to move hold-down members 8 to their upper positions. If lifting member 27 remained in its upper position, shown in dash and dot lines at 27*B* in FIG. 5, after tray 1 has been moved to its retracted position, feet 8*b* of member 8 would be disposed below lifting portion 27*B* of member 27 when tray 1 is moved to its operative or sheet feeding position. This would make it impossible to move members 8 to their upper positions even if operation arm 26 were operated to move lifting member 27 to its upper position.

FIG. 5 shows tray 1 in a position intermediate its retracted and sheet feeding positions. If lifting member 27 were in its upper operative position 27*B* when tray 1 is in this intermediate position, feet 8*b* of hold-down members 8 would move to their dash and dot line positions 8*b*A as tray 1 is moved to its operative sheet feeding position. Thus, lifting member 27 would move into its dash and dot line position 27*C* in which member 27 rides on feet 8*b*, if member 27 were moved

downwardly. When this happens, lifting member 27 would move only idly and cannot lift hold-down members 8 even if operation arm 26 is operated by hand.

In accordance with the invention, when lifting member 27 is disposed in its upper operative position, it is moved downwardly automatically to its lower inoperative position in conjunction with the movement of tray 1 to its inoperative retracted position. This is conducive to the prevention of an error in the described operation. The provision of leaf spring 31 between locking release lever 30 and the adjacent side wall 3 is effective to prevent pivotal movement of lever 30 except when it is pushed and moved by collar 5. It should be understood that other suitable means may be used for preventing inadvertent pivotal movement of member 30.

The dash and dot line positions 25A, 26A and 28A in FIG. 5 are the positions in which engaging arm 25, operation arm 26 and locking lever 28 are respectively disposed when lifting member 27 is in its upper or operative position.

It will be understood that the manner in which tray 1 is attached to the frame of the machine, the manner in which side plates 6 are mounted on tray 1 and the manner in which sheet feed roller 18 is constructed and supported, as well as the means for holding lifting member 27 in its upper operative position and moving it downwardly to its lower inoperative position in conjunction with the downward movement of feed roller 18 or feed tray 1 are not limited to the specific examples shown and described above, but that other suitable means may be used without departing from the spirit and scope of the invention.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A sheet feed device, for printing and the like sheet-utilizing machines having a frame, said device comprising, in combination, a sheet feed tray mounted on said frame; a pair of sheet hold-down members pivotally mounted on said tray and having respective pawls for holding down front corners of sheets stacked on said tray; a lifting member mounted on said frame in a position to engage said hold-down members; externally accessible operating means operable to move said lifting member from an inoperative position, out of engagement with said hold-down members, into engagement with said hold-down members and to an operative position lifting said hold-down members to an upper inoperative position, for stacking a fresh supply of sheets on said tray; holding means on said frame operable to retain said lifting member in its operative position; a sheet feed roller manually movable, independently of said operating means, between an operative position, engaging a sheet stack on said tray, and a retracted position permitting reloading of said tray; and first release means engageable and operable by said roller, upon movement thereof toward its operative position, to release said holding means for return of said lifting member to its inoperative position and lowering of said hold-down members into engagement with sheets stacked on said tray.

2. A sheet feed device, as claimed in claim 1, in which said sheet feed tray has side flanges; said hold-down members being pivotally supported by said side flanges.

3. A sheet feed device, as claimed in claim 1, in which said hold-down members have depending feet each adjacent a respective pawl; a shaft rotatably mounted on said frame; said lifting member comprising a U-shape member including a pair of legs secured to said shaft for rotation therewith and interconnected by a bight disposed beneath said feet and engageable with said feet upon movement of said lifting member toward its operative position.

4. A sheet feed device, as claimed in claim 3, in which said externally accessible operating means comprises an arm secured to an outwardly projecting end of said shaft.

5. A sheet feed device, as claimed in claim 4, in which said sheet feed roller is rotatably supported by a pair of roller support arms pivotal on a second shaft supported in said frame; said lifting member including an engaging arm secured to rotate with said first-mentioned shaft and having a bent free end; said holding means comprising a holding lever pivotal on said second shaft and having an arm formed with a notch at its free end engageable with said bent end of said engaging arm upon movement of said lifting member to its operative position to retain said lifting member in its operative position; and means on one of said support arms engageable with a second arm of said holding lever upon movement of said sheet feed roller toward its operative position, to rock said holding lever to release said bent end of said engaging arm for return of said lifting member to its inoperative position.

6. A sheet feed device, as claimed in claim 5, in which said means and said one support arm engageable with said holding lever comprises a pin extending through an arcuate slot in said frame and which is centered on the axis of said second shaft; said holding lever having a second arm engageable by said pin.

7. A sheet feed device, for printing and the like sheet-utilizing machines having a frame, said device comprising, in combination, a sheet feed tray mounted on said frame; a pair of sheet hold-down members pivotally mounted on said tray and having respective pawls for holding down front corners of sheets stacked on said tray; a lifting member mounted on said frame in a position to engage said hold-down members; externally accessible operating means operable to move said lifting member from an inoperative position, out of engagement with said hold-down members, into engagement with said hold-down members and to an operative position lifting said hold-down members to an upper inoperative position, for stacking a fresh supply of sheets on said tray; holding means on said frame operable to retain said lifting member in its operative position; a sheet feed roller movable between an operative position, engaging a sheet stack on said tray, and a retracted position permitting reloading of said tray; and first release means operable responsive to movement of said roller toward its operative position, to release said holding means for return of said lifting member to its inoperative position and lowering of said hold-down members into engagement with sheets stacked on said tray; said sheet feed tray being mounted on said frame

for movement between an inoperative retracted position and an operative sheet feeding position by external manipulation; and second release means operable, responsive to movement of said tray to its inoperative retracted position, to release said holding means for return of said lifting member to its inoperative position.

8. A sheet feed device, as claimed in claim 7, in which said sheet hold-down members are formed with depending feet each adjacent a respective pawl; a first shaft rotatably mounted on said frame; said lifting member comprising a U-shape member having a pair of legs secured to said first shaft to rotate therewith and interconnected by a bight positioned beneath said feet and engageable therewith upon movement of said lifting member to its operative position; said externally accessible operating means comprising an operating arm secured to a projecting end of said first shaft exteriorly of said frame; said sheet feed roller being rotatably supported by a pair of roller support arms pivotal on a second shaft mounted in said frame; said lifting member further including an engaging arm secured at one end to said first shaft and having a bent free end; said holding means comprising a holding lever pivotal on said second shaft and having a first arm formed with a notch in its free end engageable with the bent end of said engaging arm upon movement of said lifting member to its operative position to lock said lifting member in its operative position; said first release means comprising a pin on one of said roller support arms extending through an arcuate slot in said frame and which is concentric with the axis of said second shaft; and a second arm on said holding lever posi-

tioned in the path of movement of said pin and engageable thereby, upon movement of said roller toward its operative position, to rock said holding lever to disengage said notch from the bent end of said engaging arm to release said lifting member to return to its inoperative position.

9. A sheet feed device, as claimed in claim 8, including a third shaft pivotally mounting said tray for movement between its inoperative retracted position and its operative sheet feeding position; a rod extending transversely of said tray and extending through a second arcuate slot in said frame and concentric with the axis of said third shaft; said second release means comprising a three-arm lever pivotal on said third shaft and having first and second arms extending across said second arcuate slot and spaced apart an angular distance less than the range of angular movement of said rod for engagement by said rod as said rod reaches its limit of movement in either direction during movement of said tray between its inoperative retracted position and its operative sheet feeding position; the third arm of said three-arm lever, upon movement of said tray to its inoperative retracted position being swung, by the oscillation imparted to said three-arm lever by said rod, to engage said third arm with said second arm of said holding lever to release said notch from said bent end of said engaging arm.

10. A sheet feed device, as claimed in claim 9, including means restraining inadvertent pivotal movement of said three-arm lever.

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