

April 30, 1946.

F. R. FORD

2,399,176

DUPLICATING MACHINE

Filed June 15, 1944

3 Sheets-Sheet 1

FIG. 1.

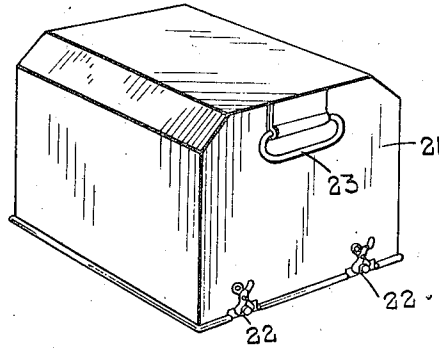
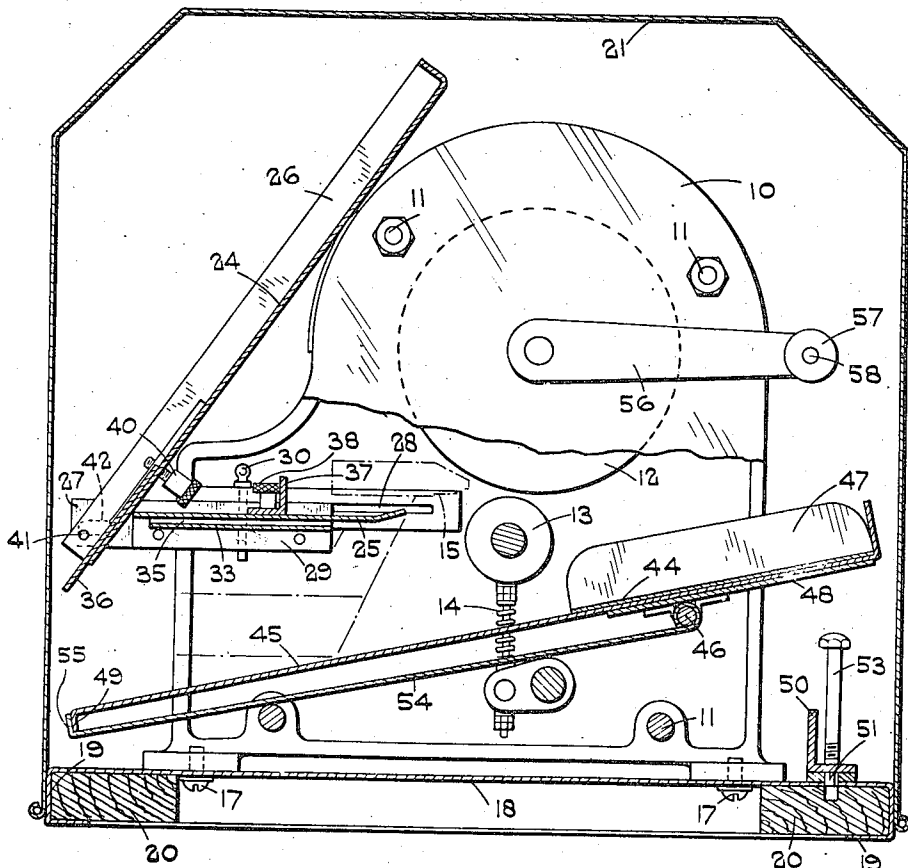


FIG. 2.



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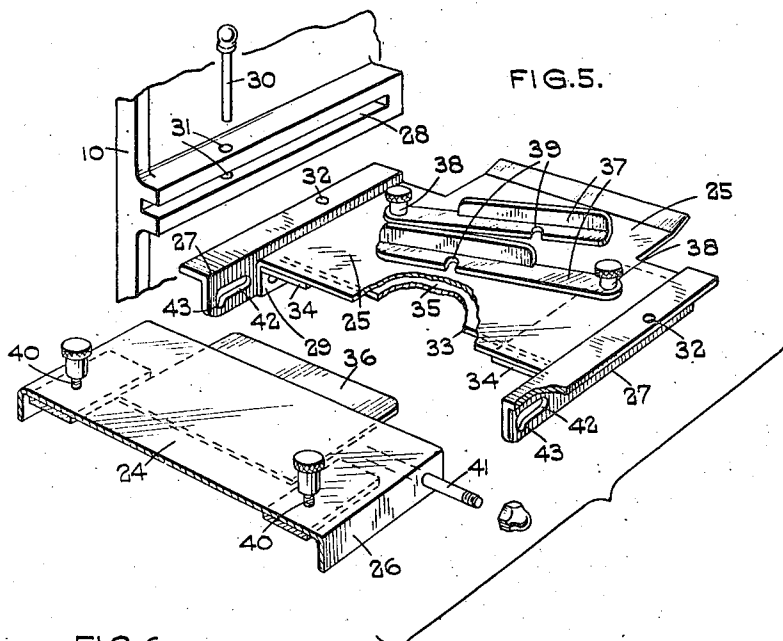


FIG. 6.

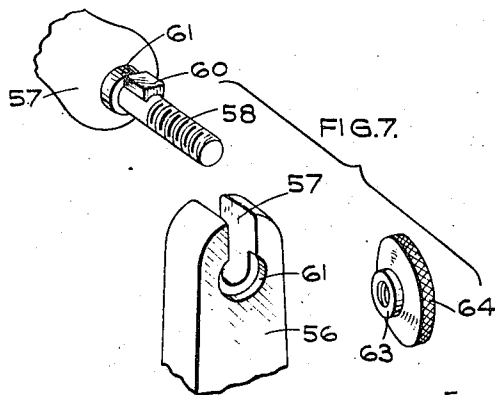
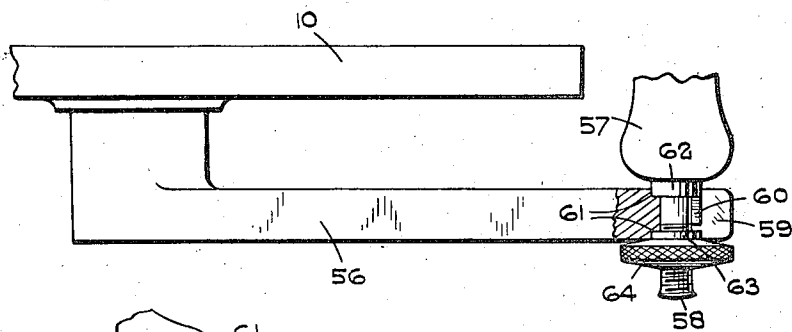


FIG. 7.

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UNITED STATES PATENT OFFICE

2,399,176

DUPLICATING MACHINE

Frank Ronald Ford, Sparkbrook, Birmingham,
EnglandApplication June 15, 1944, Serial No. 540,485
In Great Britain March 31, 1943

4 Claims. (Cl. 101—132.5)

This invention relates to duplicating machines and refers more particularly to machines of the kind in which a copy sheet and a master sheet bearing in reverse script the matter to be reproduced, are passed in pressure contact between the cylinder which carries the master sheet and a pressure roller, the copy sheet being moistened before being brought into contact with the master sheet.

The present invention is particularly applicable to such machines wherein the pressure roller is situated beneath the cylinder on which the master sheet is mounted, and wherein the copy sheets are fed over a feed tray, moistened on their upper sides, and pass out of the machine, on to a receiving tray, with the reproduced matter on their upper sides.

The object of the present invention is to provide certain improvements in the construction of this type of machine whereby, when out of use, it can be folded or collapsed into a very compact position and can be transported without difficulty.

According to one feature of the present invention, the machine is mounted on a baseboard with which is associated a hollow cover having means whereby it may be attached at its lower edge to the baseboard, the cover and baseboard between them serving to enclose the machine.

According to a further feature of the present invention, the feed tray or the main part thereof is pivotally associated with a pair of slides at its edges, which slides are adapted to rest in or on guides provided on the inner sides of the side members of the machine and adapted to be retained therein or thereon, the feed tray or its main part being adapted to be swung upwardly on its pivots so as to lie snugly against the front part of the machine when out of use.

According to yet another feature of the present invention, a receiving tray is provided which is made in two parts, one of which is slidable in relation to the other, one part being pivoted to the frame of the machine upon an axis extending transversely thereof between the rear portions of the frame side members, and the other part of the tray being movable, back and forth in or on the said pivoted tray part, so that, when the machine is out of use, the receiving tray as a whole can be collapsed and disposed snugly between the side members of the machine frame and under the pressure roller.

Also according to the present invention, the crank handle which is employed to turn the cylinder is detachable from the crank, so that, when

it is desired to put the machine away, the handle can be detached and reattached to the crank so that it projects inwardly towards the machine instead of outwardly away from the machine.

In order that my invention may be clearly understood and more readily carried into practice, I have appended hereto three sheets of drawings, wherein:

Figure 1 is a perspective view of a cover combined with a base to form an enclosure for a duplicating machine.

Figure 2 is a part-sectional side elevation of the machine and its enclosure showing the out-of-use position of the feed and receiving trays.

Figure 3 is a similar view of the lower part of the machine, with the trays in their extended positions ready for use.

Figure 4 is a plan view, to a small scale, with the trays in the same position as in Figure 3.

Figure 5 is a perspective view showing the parts of the feed tray separated from one another and the method of supporting the tray on the frame of the machine.

Figure 6 is a part-sectional plan view of the operating crank showing the detachable handle in its out-of-use position, and

Figure 7 is a fragmentary perspective view showing the method of attaching the loose handle to the crank.

In the construction illustrated, the duplicating machine has a rigid frame comprising cast side members 10 connected by suitable tie-bars 11 and within which an impression cylinder 12 and a pressure roller 13 are rotatably mounted in parallel relationship, the roller 13 being arranged below the cylinder 12 and normally maintained in pressure contact therewith by springs 14.

The cylinder 12 is provided with a suitable clip (not shown) whereby the leading edge of a master sheet may be attached thereto, and copy sheets previously moistened on their undersides are brought into contact with this master sheet by passing them through the nip between the cylinder 12 and pressure roller 13, the copy sheets being supported before and after treatment on trays which will be more fully described hereinafter. The moistening of the copy sheets is effected by pressing them against a stationary pad 15 which is kept damp by means of liquid drawn from a tank 16.

The side members 10 of the machine are secured by screws 17 to a metal baseboard in the form of a plate 18 having marginal flanges 19 which extend first downwardly and then inward-

ly, the channels formed between the plate 18 and the intumed portions of the flanges 19 being filled by wooden strips 20 which stiffen the plate 19. Alternatively, a baseboard formed wholly of wood may be used.

Associated with the baseboard is a hollow sheet metal cover 21 of any suitable shape, the lower edge of which engages around the marginal flange 19 of the plate 18 and is detachably secured thereto by means such as the catches 22 shown in Figure 1. If desired, the cover 21 may be provided with carrying handles 23.

The feed tray above-mentioned is formed in two parts 24, 25 of unequal size, the main part 24 normally projecting in front of the machine, whilst the smaller part 25 is disposed between the side members 10 of the latter.

The main tray part 24 is provided at its lateral edges with downturned flanges 26 which are pivoted to angle section slides 27 engaging in guides 28 formed on the inner faces of the frame side members 10, these slides being riveted or otherwise secured to marginal flanges 29 on the rear tray part 25.

If desired, the slides 27 may be located against endwise movement in the guides 28 by means of pins 30 which are inserted through holes 31 in the sides of the guides 28 and through registering holes 32 in the slides 27.

A metal plate 33 is secured to the underside of the rear tray part 25, but spaced away from the latter by distance strips 34, so that a slot 35 is provided at the front end of the tray part 25 for engagement by a tongue 36 at the rear end of the main tray part 24, as shown in Figure 5.

When the tongue 36 is engaged with the slot 35, the two tray parts 24, 25 together present a continuous rigid surface adapted to support a stack of copy sheets, as shown in Figure 3.

This surface may be provided with edge guides for the copy sheets, such guides preferably being formed as angle-section bars 37 which are pivoted at 38 to one of the tray parts, upon axes perpendicular to the plane of the latter, and are adapted to be swung into an operative position in which they extend along the other tray part, means being provided for detachably locking them in this position so that they not only increase the rigidity of the feed tray as a whole but also lock the two parts thereof against relative endwise movement.

In the construction illustrated, the guide bars 37 are pivoted to the rear tray part 25 and notches 39 in the lower flanges of such bars can be engaged with clamping screws 40 carried by the main tray part 24, the screws 40 being then tightened to grip the bars 37 and to hold them in their operative positions.

Before the main tray part 24 can pivot in relation to the rear part 25, it must be slid forwardly to release the tongue 36 from the slot 35, and to permit of this, the tray part 24 is provided with coaxial trunnions 41 which extend through longitudinal slots 42 in the adjacent flanges of the slides 27 on the other tray part and are provided with slots 42 externally of the latter, these slots 42 preferably being of L shape with downwardly extending circular enlargements 43 at their forward ends which accommodate the trunnions 41 during pivotal movement of the main tray part 24.

The arrangement above described enables the main part 24 of the feed tray to be swung into the out-of-use position shown in Figure 2, and

it will be understood that similar provision for a combined sliding and pivotal movement, with the same object in view, may be made in the case of a one-piece feed tray.

The receiving tray associated with the machine is also made in two parts 44, 45, the part 44 being disposed between the rear portions of the frame side members 10 and pivoted at or near its front edge upon a rod 46 extending transversely of the machine.

This pivoted tray part 44 is formed with upturned lateral flanges 47 and a plate 48 secured to its underside is spaced away from the latter by suitable distance strips or other means so that a narrow opening is provided through which can slide the second part 45 of the tray.

This slidable tray part 45 normally projects rearwardly of the machine as shown in Figure 3, its outward movement being limited by engagement of a lip 49 on its front edge with the adjacent end of the plate 48. An angle section stop 50 for the stack of copy sheets may be provided on the upper surface of the tray part 45 and this strip may be located in any of a number of alternative positions by means of pegs 51 thereon engaging spaced pairs of holes 52 in the tray part 45.

The receiving tray, when extended, may rest upon two laterally spaced posts or supports 53, whose height may be adjustable to vary the inclination of the tray, and when not required for use the tray part 45 is slid forwardly in relation to the pivoted tray part 44, the latter being rocked upon the rod 46 until eventually the assembly reaches the position shown in Figure 2, with the tray part 45 beneath the pressure roller 13, to guide the slidable tray part 45 during its movement into or out of this out-of-use position, there may be provided a supporting plate 54, which has its rear end pivoted on the rod 46 and rests upon one of the tie-bars 11, connecting the frame side members 10. An upturned lip 55 at the front end of this guide plate 54 forms a stop for the slidable tray part 45. When the tray part 45 is in the out-of-use position, the stop 50 normally associated therewith may be accommodated between the adjustable posts or supports 53 as shown in Figure 2.

The driving crank 56 associated with the cylinder 12 is provided with a detachable handle 57 which, when the machine is not in use, can be removed from the crank 56 and re-attached thereto so that it projects inwardly behind the cylinder 12 instead of outwardly.

In the convenient arrangement shown in Figures 6 and 7, the handle 57 is rotatably mounted in known manner on a coaxial spindle 58 and one end of this spindle is engaged in an open longitudinal slot 59 at the free end of the crank 56. An integral or other key 60 on the spindle 58 is adapted to engage the sides of the slot 59 to prevent angular movement of the spindle.

Adjacent the slot 59 the end of the crank 56 is formed at opposite sides with similar recesses 61 adapted to receive a collar 62 on the spindle 58 behind the key 60 and a binding projection 63 on a nut 64 which is screwed on the end of the spindle; so that the handle 57 may be mounted at either side of the crank 56 and secured in position by tightening the nut 64.

What I claim then is:

1. In a duplicating machine, a rigid frame and a feed tray formed in two parts and adapted to support copy sheets about to be fed into the machine, the main part of said feed tray normally

projecting in front of the machine and the second part of said feed tray being secured in a substantially horizontal position within said frame, and a tongue on one of said tray parts normally engaged with a slot in the other of said tray parts in a manner to retain said tray parts in coplanar relationship, said main tray part being capable of sliding movement relatively to said second tray part to disengage said tongue from said slot and also capable of pivotal movement in relation to said second tray part to enable it to be upturned against the front of said frame when not in use.

2. In a duplicating machine, a rigid frame, a feed tray formed in two parts and adapted to support copy sheets about to be fed into the machine, the main part of said feed tray normally projecting in front of the machine and the second part of said feed tray being disposed substantially horizontally within said frame, opposed guides provided internally of said frame, lateral slides on said second tray part engaging said guides, means for securing said slides against endwise movement relatively to said guides, a tongue on one of said tray parts normally engaged with a slot in the other of said tray parts in a manner to retain said tray parts in coplanar relationship and trunnions on said main tray part engaging longitudinal slots in said slides whereby said main tray part may be moved endwise to disengage said tongue from said slot and thereafter pivoted on said slides to enable it to be swung into an out-of-use position upturned against the front of said frame.

3. In a duplicating machine, a rigid frame, a feed tray formed in two parts and adapted to support copy sheets about to be fed into the machine, the main part of said feed tray normally projecting in front of the machine and the second part of said feed tray being secured in a substantially horizontal position within said frame, a tongue on one of said tray parts normally engaged with a slot in the other of said tray parts in a manner to retain said tray parts in coplanar relationship, said main tray part being

capable of sliding movement relatively to said second tray part to disengage said tongue from said slot and also capable of pivotal movement in relation to said second tray part to enable it to be upturned against the front of said frame when not in use, edge guides for said copy sheets pivoted to the upper surface of one of said tray parts upon axes perpendicular to such surface, said edge guides being adapted to be swung into an operative position in which they extend across the surface of the other of said tray parts, and means for detachably securing said edge guides to said other tray part to lock the two tray parts against relative endwise or pivotal movement.

4. In a duplicating machine, a rigid frame, a feed tray formed in two parts and adapted to support copy sheets about to be fed into the machine, the main part of said feed tray normally projecting in front of the machine and the second part of said feed tray being disposed substantially horizontally within said frame, opposed guides provided internally of said frame, lateral slides on said second tray part engaging said guides, means for securing said slides against endwise movement relatively to said guides, a tongue on one of said tray parts normally engaged with a slot in the other of said tray parts in a manner to retain said tray parts in coplanar relationship, trunnions on said main tray part engaging longitudinal slots in said slides whereby said main tray part may be moved endwise to disengage said tongue from said slot and thereafter pivoted on said slides to enable it to be swung into an out-of-use position upturned against the front of said frame, edge guides for said copy sheets pivoted to the upper surface of one of said tray parts upon axes perpendicular to such surface, said edge guides being adapted to be swung into an operative position in which they extend across the surface of the other of said tray parts, and means for detachably securing said edge guides to said other tray part to lock the two tray parts against relative endwise or pivotal movement.

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