

A. P. KARBACH, JR., ET AL

COLLATING APPARATUS

Filed Jan. 16, 1943

6 Sheets-Sheet 1

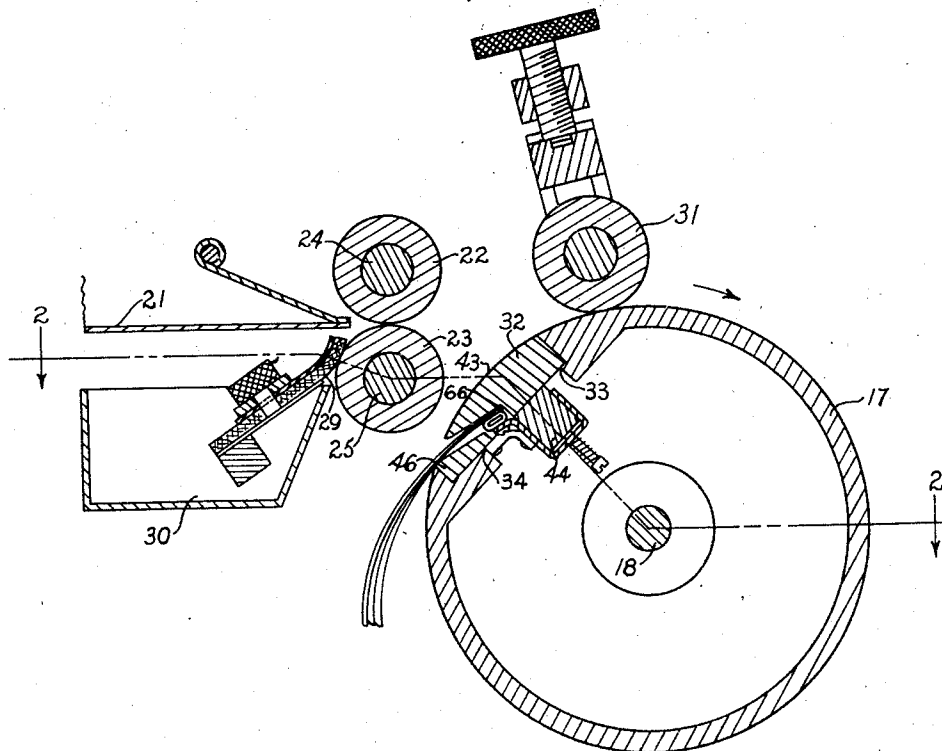


FIG. 1

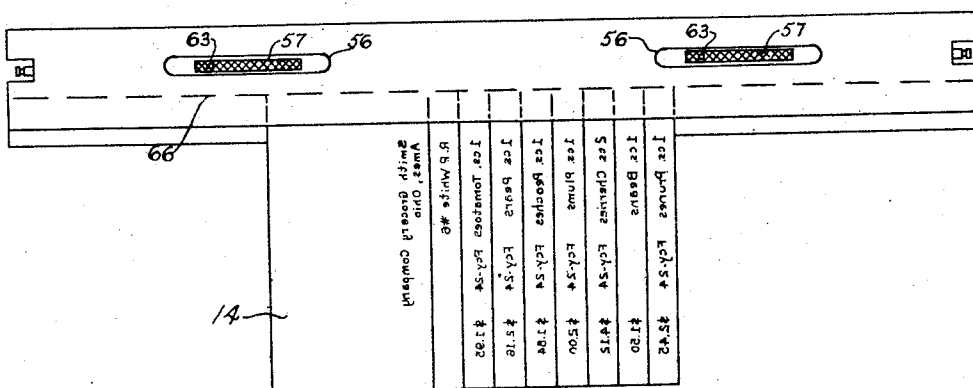


FIG. 3

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April 16, 1946.

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2,398,646

COLLATING APPARATUS

Filed Jan. 16, 1943

6 Sheets-Sheet 2

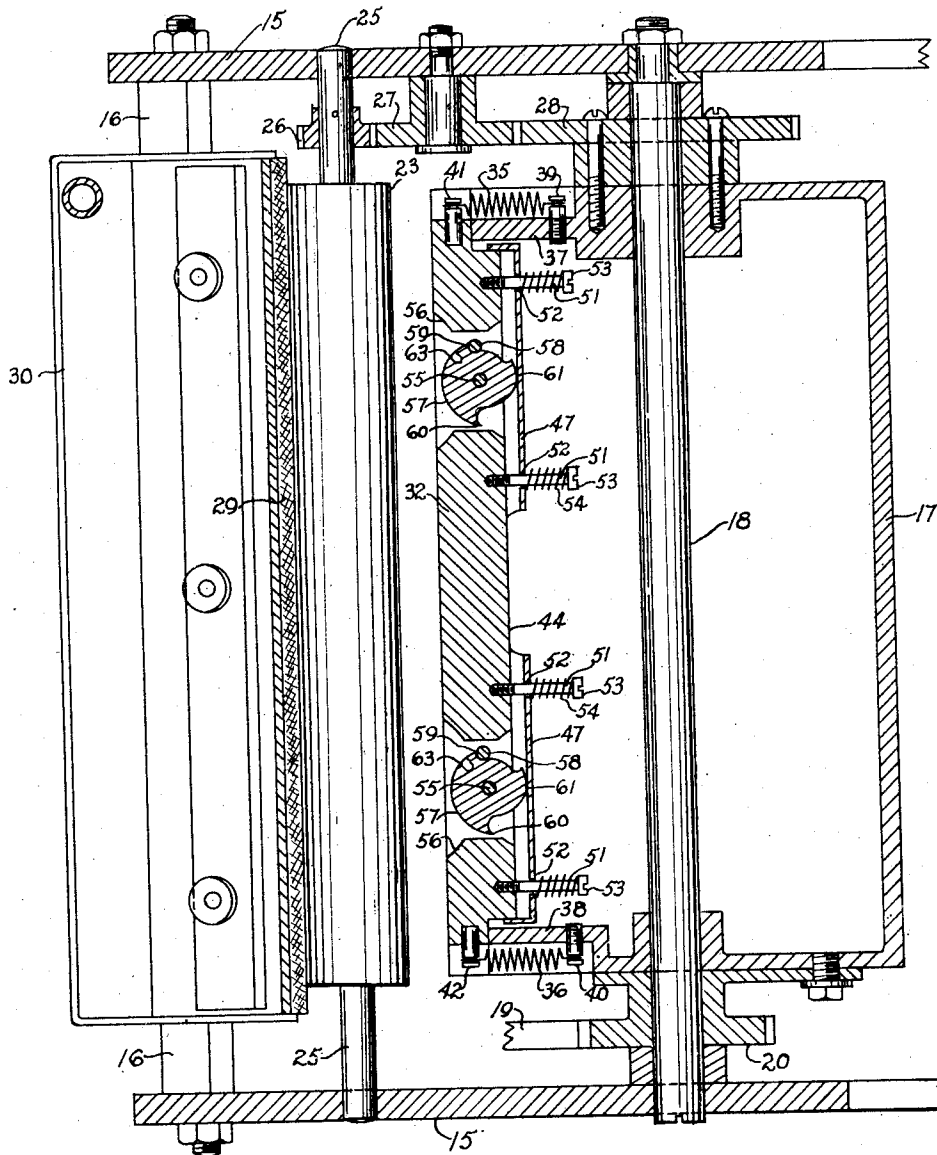


FIG. 2

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COLLATING APPARATUS

Filed Jan. 16, 1943

6 Sheets-Sheet 3

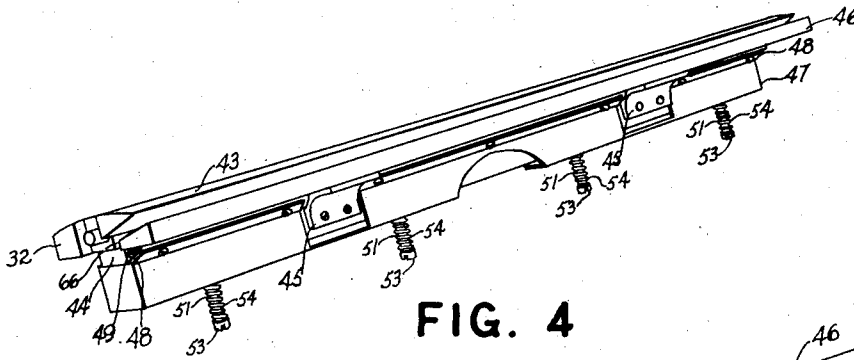


FIG. 4

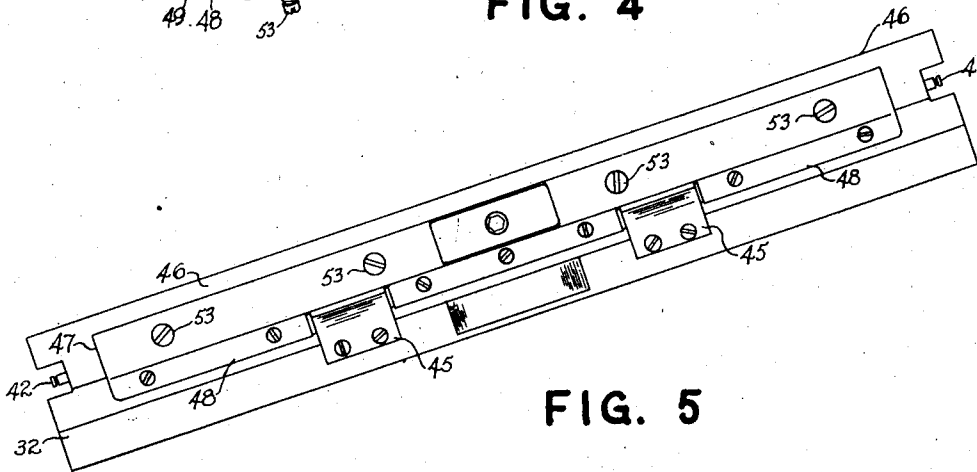


FIG. 5

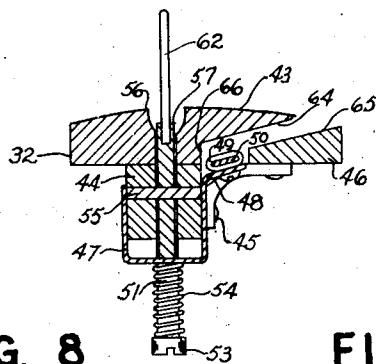


FIG. 8

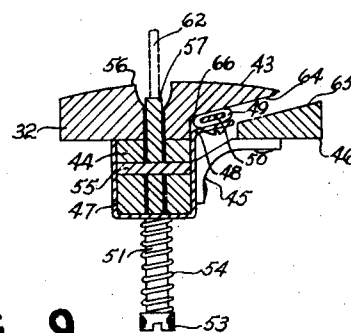


FIG. 9

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COLLATING APPARATUS

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6 Sheets-Sheet 4

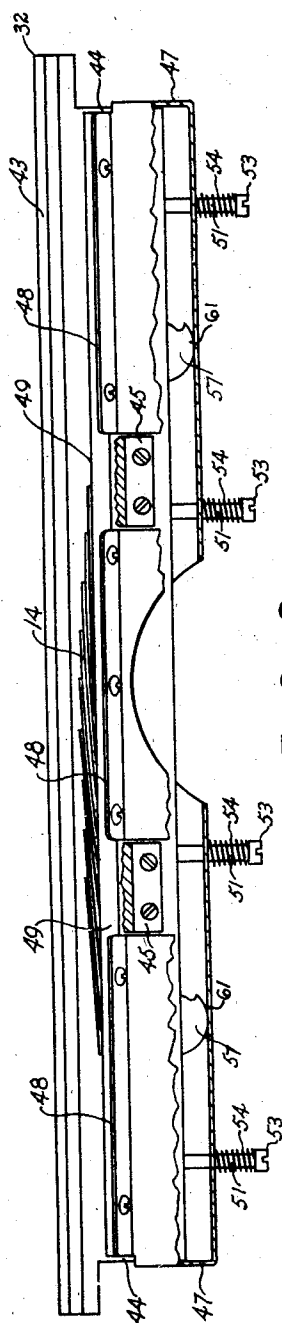


FIG. 6

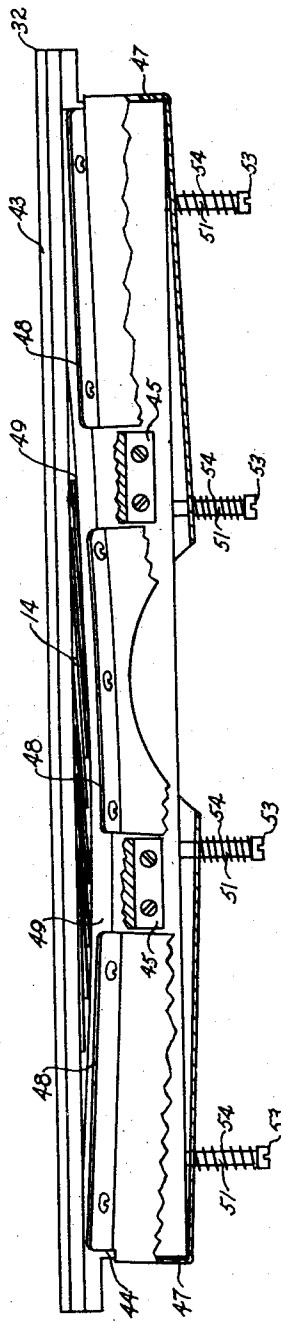


FIG. 7

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COLLATING APPARATUS

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6 Sheets-Sheet 5

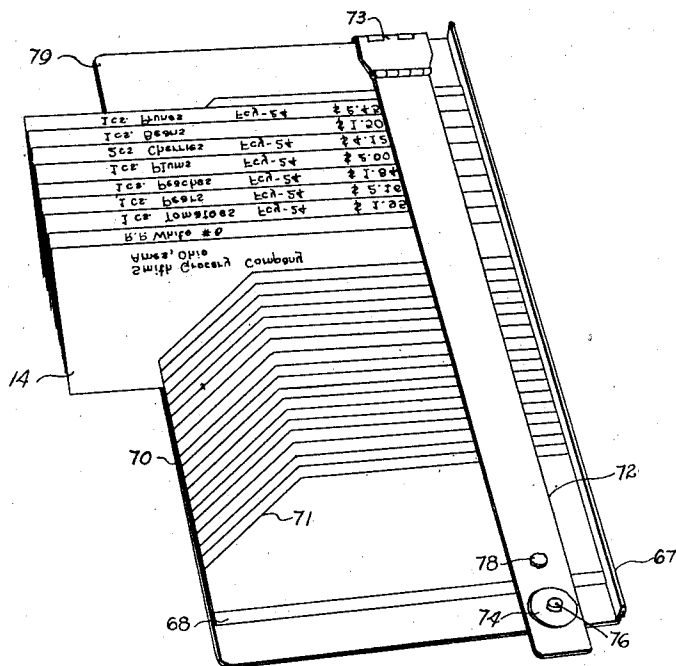


FIG. 10

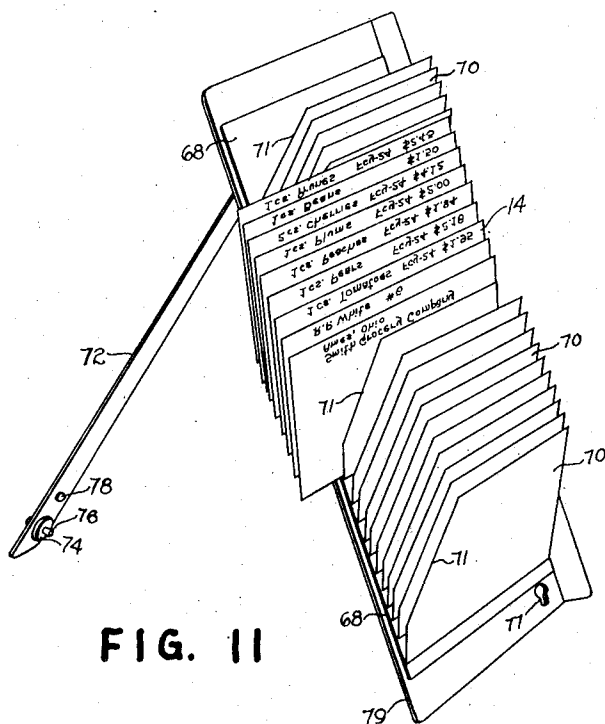


FIG. 11

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2,398,646

COLLATING APPARATUS

Filed Jan. 16, 1943

6 Sheets-Sheet 6

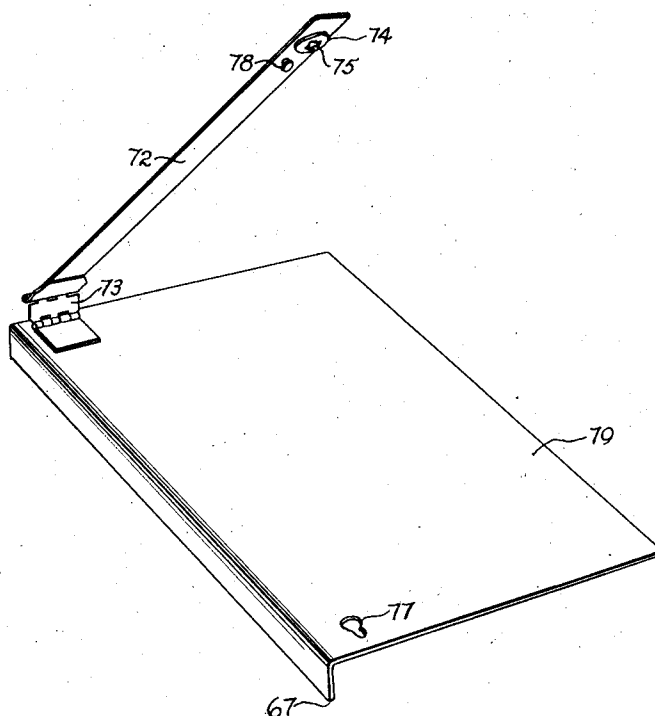


FIG. 12

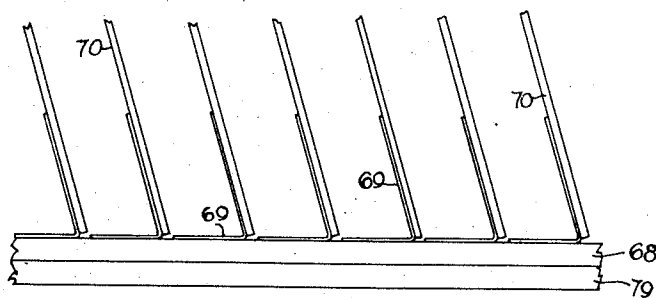


FIG. 13

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UNITED STATES PATENT OFFICE

2,398,646

COLLATING APPARATUS

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Application January 16, 1943, Serial No. 472,560

3 Claims. (Cl. 101—132)

This invention relates in general to duplicating machines. More particularly the present invention relates to rotary duplicators wherein a printing cylinder or platen is provided with a clamping device adapted to secure in operating position a plurality of master copies.

It is one of the objects of the invention to provide devices whereby on a rotary duplicator lists may be conveniently and rapidly produced which are made up of items each of which individually appears upon one of a series of master copy cards or sheets and the like.

Another object is to provide means for securing to the printing cylinder or platen of a duplicator in a pre-arranged alignment a plurality of master copy cards or sheets and the like.

Another object resides in the provision of a clamp or carriage adapted to compensate for the varying thickness of a series of master copy cards or sheets and the like held in an overlapping position upon the printing cylinder or platen of a rotary duplicator.

Another object is the provision of a clamp or assembling device which facilitates the collating and securing of a series of cards or sheets and the like in a prearranged order and position whereby they may be quickly and conveniently transferred to the printing cylinder clamp of a rotary duplicator.

Another object is to provide a master copy clamp for a rotary duplicating machine capable of holding the edges of a series of cards or sheets and the like arranged in overlapping positions so that they are in operating position and cannot change their pre-arranged alignment, during the rotation of the printing cylinder, but which will not damage or bend the edges so held.

Another object of this invention resides in the provision of a clamping device in which a plurality of master copy cards or sheets may be quickly and easily positioned for clamping, and in which proper alignment for registration with the clear sheets to be printed upon may be maintained.

Another object is to provide a clamp actuating means that may be embodied within the face of the printing cylinder or platen of a machine of the character described so as not to extend beyond the plane flush with the face, when in operative position and which is operated by a simple unobstructive external means.

Other objects and advantages of the invention will be apparent from the following description, the appended claims, and the accompanying drawings.

In the drawings, in which a preferred embodiment of the invention has been illustrated:

Fig. 1 is a diagrammatic sectional end view through a rotary type duplicator embodying one form of the present invention and showing the printing cylinder clamping device in operating position;

Fig. 2 is a transverse section taken substantially along line 2—2 of Fig. 1 with the printing cylinder rotated 315° in the direction of the arrow;

Fig. 3 is a top elevation of the printing cylinder device showing a series of master copies held in position;

Fig. 4 is a perspective view from one side of the printing cylinder clamping device;

Fig. 5 is a bottom elevation of the printing cylinder clamping device;

Fig. 6 is a side elevation, partly in section, of the clamping device in its open position with a series of master copy cards inserted therein;

Fig. 7 is a similar view to that of Fig. 6, but showing the clamping device in its closed position locking a series of master copy cards in operating position;

Fig. 8 is a detached vertical section through the printing cylinder clamping device in its open position;

Fig. 9 is a view corresponding to Fig. 8, but showing the clamp in its closed operative position;

Fig. 10 is a top elevation of the collator showing the binding bar locked in position to hold a series of cards (master copies) in alignment preparatory to insertion in the printing cylinder clamp;

Fig. 11 is a perspective view from one side of the device as shown in Fig. 10, but showing the binding bar unlocked and swung out of locked position so that cards or sheets may be inserted or removed;

Fig. 12 is a perspective view from the back of the collator showing the hinge construction of the binding bar; and

Fig. 13 is an enlarged fragmentary side elevation of the collator showing a few of the dividers in the raised position and a means for attaching them.

Referring more particularly to the drawings by reference numerals, the rotary type duplicating machine illustrated in Figs. 1 and 2 is provided with opposed side frames 15 in which are mounted the operating elements. Frames 15 are retained in spaced relation by suitable tie rods, one of which is shown at 16. The printing cylinder or platen 17 is rotatably mounted on the shaft 18

which, in turn, is secured against rotation in the side frames.

A drive mechanism, not shown, to intermittently rotate platen 17 is provided and comprises a pinion and intermediate gearing rotated by any suitable source of power. One of such gears 19 meshes with a coacting intermittent gear 20 which, in turn, is adjustably secured to platen 17. In general, the drive mechanism is of a type well known in the art, an example of such being shown and described in United States Letters Patent No. 2,069,729, issued February 2, 1937, to F. W. Storck.

The clear sheets to be printed upon are supported upon shelf 21, Fig. 1, so that they can be fed to the moistening and feeding rolls 22 and 23. Feed roll 22 is provided with a shaft 24 extending beyond each end thereof to form journals designed to rotate in adjustable bearings in the side frames. Preferably this roll is driven by frictional engagement with roll 23. Moistening roll 23 is secured to a shaft 25 also rotatably mounted in suitable bearings. Shaft 25, in turn, has secured thereto a gear 26 which is engaged by and rotated by an intermediate gear 27 which meshes with a gear 28 secured to printing platen 17. Thus the feed and moistening rolls 22 and 23 are intermittently rotated with the printing platen 17.

As the clear sheets are advanced from shelf 21 between the rolls 22 and 23, their underface is moistened by roll 23 which has received its moisture, as shown in Fig. 1, by means of a wick 29 disposed in engagement with roll 23 and a fluid supply tank 30. A clear moistened sheet is advanced by rolls 22 and 23 into engagement between the rotating printing cylinder or platen 17 and pressure roll 31 whereby copy secured to the platen is reproduced on the moistened face of the clear sheet. Since the functioning of rotary duplicating machines of the above general character is well known in the art further detailed description is omitted.

Printing cylinder or platen 17 is of a hollow cylindrical construction, see Figs. 1 and 2, having its face wall cut away to receive the master copy clamp, generally indicated by the numeral 32, which extends between the opposed end walls thereof. Inwardly projecting portions 33 and 34, Fig. 1, of the platen form shoulders upon which clamp 32 is secured. Yielding tension means, preferably in the form of coiled springs, as illustrated at 35 and 36 in Fig. 2 are provided at each end of the platen to secure clamp 32 in place upon the shoulders during rotation. Projecting into the recessed area formed by the off-set end walls 37 and 38 of the platen are pins 39 and 40. One end of each of the springs 35 and 36 is attached to pins 39 and 40 while the other end of each spring is attached to corresponding pins 41 and 42 projecting from each end of clamp 32. Through this means the clamp is yieldably but securely held in position upon shoulders 33 and 34 of the platen.

Clamp 32 comprises an upper supporting portion having an outer arcuate face 43 adapted to effect a continuity of the peripheral face of platen 17 and a lower depending member 44 formed as an integral part thereof. Attached to member 44 by means of screw brackets 45 is a base rail or copy supporting member 46 so positioned as to cooperate with member 43 to form a card or sheet receiving throat. See Figs. 1, 4 and 8. A hollow casing 47 slidably mounted upon member 44 has an edge thereof partially bent over to form a

supporting edge 48, extending the entire length of portion 43 and rail 46, to which is fastened, by means of screws, a strip of rubber tubing 49 having a steel supporting core 50 therein. This tubing 49 as will be hereafter explained serves as a binding bar or gripping means to hold the edges of the master copy cards or sheets 14 in the throat of clamp 32 of the platen.

Casing 47 is slidably secured to member 44 with yielding tension means, preferably comprising a plurality of inwardly extending studs 51 threadedly engaged in the inner depending member 44 and projecting through suitably enlarged openings 52 in the casing 47. Each stud 51 is provided with an enlarged head 53 that acts as a bearing for one end of the compression spring 54 which encircles the stud. The opposed end of spring 54 has its bearing against the bottom of casing 47. It will be readily seen that the amount of pressure exerted by each coiled spring on casing 47 will depend upon how far stud 51 has been screwed into member 44. These studs and springs provide a variable pressure means normally urging the rubber covered binding bar 49 upward to engage the edges of the overlapping master copy cards or sheets 14. Through this means the bar is adapted to compensate for the varying thickness produced by the overlapping edges of the cards or sheets.

Supported within member 44 are one or more rotatable shafts 55 the ends of which terminate flush with the sides of member 44 so as not to interfere with the sliding movement of casing 47. Disposed within one or more slotted apertures 56, formed within clamp 32 and extending through it from face 43 to the bottom of member 44, as illustrated in Fig. 2, are cams 57 which are secured to and partially rotatable on shafts 55. Pins 58 projecting from the inside of member 44 into aperture 56, as illustrated in Fig. 2, are so positioned as to contact shoulder 59 of the cams and thereby prevent further rotation in that direction. Rotation of the cams in the opposite direction brings shoulders 60 down and into contact with casing 47, and raises the nose 61 of the cam thereby releasing the pressure exerted against the casing. Cams 57 being adapted to engage the inner face of casing 47, raise or lower it with relation to member 44. See Figs. 8 and 9. Through this means the binding bar 49 is raised in the throat of clamp 32 to grip the master copy cards or sheets placed therein and hold them in alignment.

To open clamp 32 the cams 57 are rotated to the right, as viewed in Fig. 2, by means of a key 62 inserted through aperture 56 into a slotted key-way 63 formed in the top of each cam. This rotation brings surface 61 of the cam down into contact with casing 47 depressing it which, in turn, compresses springs 54. The clamp 32 will then be in the open position, as illustrated in Fig. 8, and ready to receive the master copy cards or sheets. After they are in position, the cams are rotated to the left so as to raise nose 61 which permits the action of the springs 54 to raise casing 47, whereby the tubing 49 is pressed upward to close the clamp as shown in Fig. 9.

In operation the edges of the master copy cards or sheets 14 are aligned in an overlapping or shingled relationship with respect to each other, as shown in Figs. 3 and 11. They are then inserted in the slot or throat formed between the open faces 64 and 65 of clamp 32, see Figs. 3, 6 and 7, and are pushed back until the edges are aligned against the back formed at 66 on the un-

derside of face 43. Tubing 49 is then raised and grips these edges holding the master copy firmly in place.

Figs. 10, 11, 12 and 13 illustrate one form of the card or sheet assembler. A flat piece of sheet metal generally indicated by the numeral 79 comprises the main body or supporting member. If preferred, this member may be composed of wood, plastics or any other similar lightweight substances. One edge of member 79 is bent at right angles as shown at 67 to form a stop or aligning shoulder for the master copy cards or sheets as they are inserted.

A thin sheet of cardboard 68 is glued, or fastened in any other suitable manner, to member 79 to form a base. Hinged to this base 68 by means of gummed linen strips 69 are a series of dividers 70, serving as partitions to separate each of the master copy cards or sheets. These dividers are preferably made of paper or card stock, corner cut as at 71 to facilitate the insertion of master copies 14 and fastened so as to be easily raised or lowered with respect to the base 68. A gummed linen strip 69 forms a hinge for each divider, as shown in Fig. 13, being fastened across the entire lower edge of each divider and to the base. As will be readily understood the size and distance or spacing between the dividers may be varied depending, for example, upon the size of master copy card or sheet 14 and the number of items to be taken from each per invoice and the size of platen used in the duplicator. This spacing will also control the amount of marginal exposure obtained when the dividers are in the prone position.

Fastened to member 79 along the top edge is a thin metal strip or binding bar 72. A two-way or double acting hinge 73 welded to the back side of member 79, as shown in Fig. 12, and to one end of bar 72 provides the fastening means. At the other end of bar 72 is an aperture in which is fitted a locking device 74 having normally extended prongs 75 which are retracted when a button 76 is depressed. These prongs are adapted to extend through an elongated pear shaped slot 77 cut through member 79 and catch on the underside thereof to lock bar 72 in the position shown in Fig. 10. Since this type of locking means is well known and commonly used further description of it will be omitted. Positioned above locking device 74 and projecting from the upper side of bar 72 is a locking stud 78 provided with an enlarged head which is adapted to be inserted into the upper or wide end of slot 77 and pulled back to wedge in the lower or narrow end. In this way bar 72 may be locked down on the underside of member 79 out of the operator's way when cards are being inserted between the dividers. It is to be understood that the binding bar herein described is a preferred form only and that the present invention is not limited to that type of binding means. Any means which will hold down the dividers after the master copies 14 have been inserted will suffice.

The operator when preparing to insert cards or sheets in the assembler unlocks binding bar 72 by depressing the lock button 76. Due to the double hinge construction 73, the bar when unlocked may be swung completely around and locked against the bottom of the unit by wedging stud 78 into slot 77. Master copy cards or sheets are then dropped into position between the dividers 70. When the

last card or sheet is in position the operator taps the left or extended edges to align them against the right edge 67, then by running the hand down the feathered top edges they are aligned against the bottom guide or base 68. Binding bar 72 is then swung around and locked in position, Fig. 10, holding the collated cards or sheets in alignment until they are fed into and locked in clamp 32, as shown in Figs. 3, 6 and 7.

While the devices and apparatus herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise devices and apparatus and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

Having thus described our invention, we claim:

1. A master copy clamping device for a rotary duplicator platen comprising an upper member having an arcuate outer face normally fitting flush with the face of said platen and disposed in a recess extending transversely of the platen face, a copy supporting member retained in spaced relation with the upper member whereby a throat is formed for the insertion of a plurality of cards or sheets and the like, a binding bar provided with a resilient cover, said bar extending along the underside of the outer face of said upper member and having pressure rotatable cam means associated therewith normally urging it upward to close said throat, and means carried within the upper member for depressing said bar to open the throat and to retain it in such position.

2. In a rotary duplicating machine, the combination with the printing platen of: a clamping member adapted to hold a series of overlapping master copy cards or sheets and the like in alignment whereby a list may be reproduced containing only certain items selected from each one of the master copies; said member comprising an upper portion having an outer arcuate face and a substantially flat inner face; a copy supporting member retained in spaced relation with the inner face of said upper portion to form a throat for the insertion of the edges of said master copy; a binding bar provided with a resilient cover, said bar having yielding pressure means forcing it upward against the inner face of said upper portion thereby closing said throat; and rotatable cam means positioned within said upper portion and operable from the upper side thereof for depressing the binding bar to open the throat.

3. In a device of the character described having a rotatable printing platen and means for rotating said platen, a clamping member for said platen adapted to clamp in operating position the edges of a series of overlapping master copy cards or sheets and the like; a copy supporting member retained in spaced relation with the clamping member and forming a master copy receiving throat therewith; a rubber covered binding bar adapted to coact with the clamping member to hold said master copy within the throat; variable pressure means carried by the clamping member forcing said binding bar upward; and cam means carried within the clamping member operable from the outer face of the clamping member to depress and hold down the binding bar whereby said master copy can be positioned in the throat.

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