Sept. 22, 1942. M. P. NEAL 2,296,533

FLEXIBLE PLATE MOUNTING MEANS FOR DUPLICATING MACHINES

Original Filed April 7, 1939 2 Sheets-Sheet 1

Fig. 1

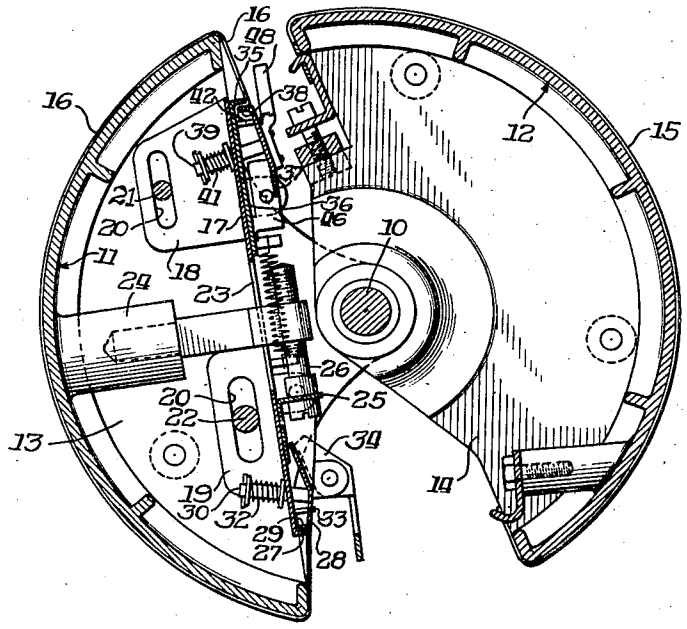


Fig. 4

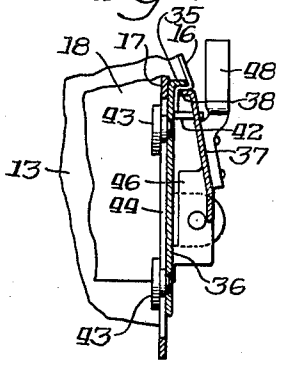


Fig. 5

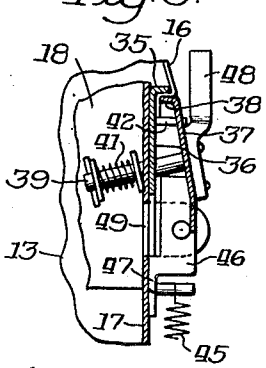


Fig. 6

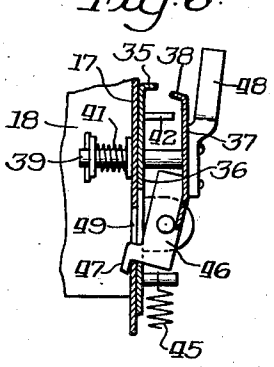


Fig. 7

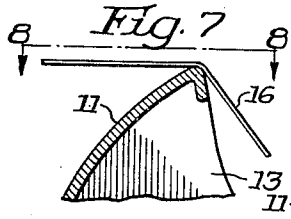
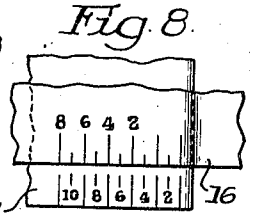


Fig. 8



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FLEXIBLE PLATE MOUNTING MEANS FOR DUPLICATING MACHINES

Original Filed April 7, 1939 2 Sheets-Sheet 2

Fig. 3.

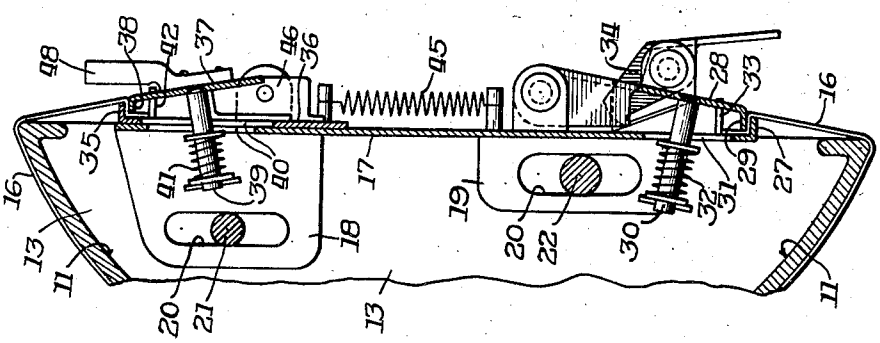
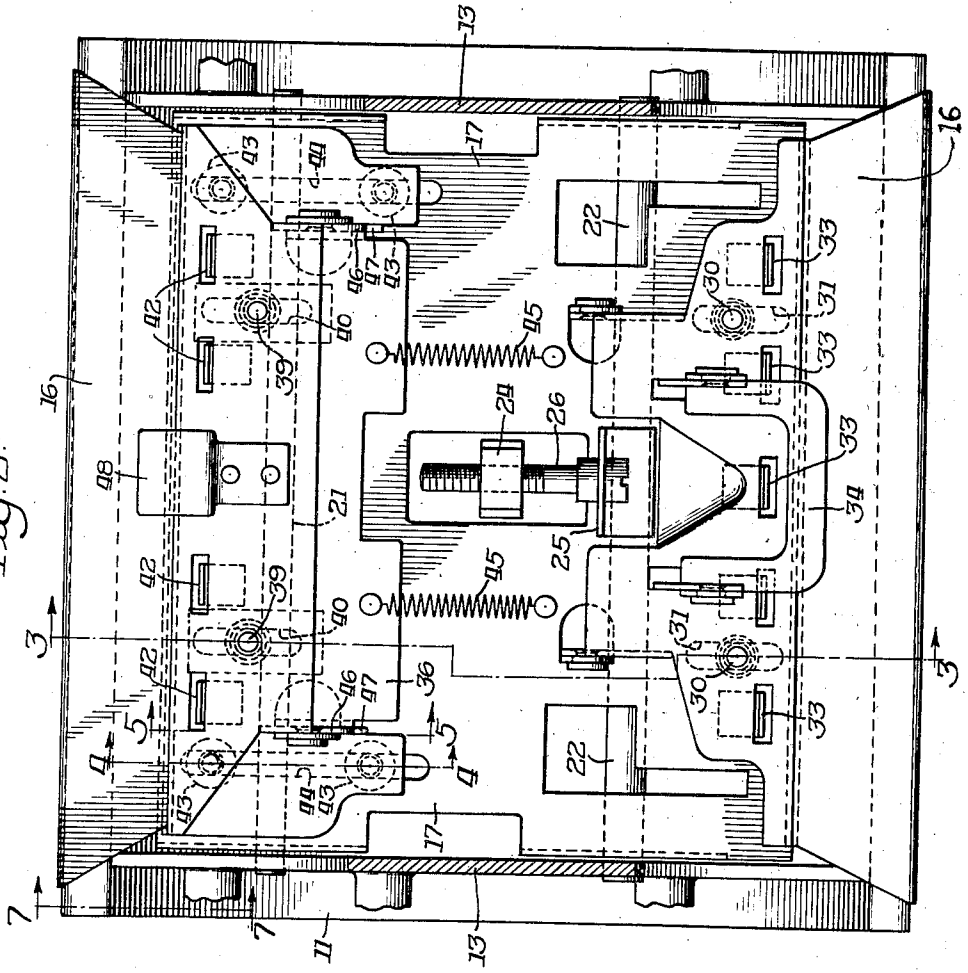


Fig. 2.



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UNITED STATES PATENT OFFICE

2,296,533

FLEXIBLE PLATE MOUNTING MEANS FOR DUPLICATING MACHINES

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Original application April 7, 1939, Serial No. 266,518. Divided and this application October 25, 1941, Serial No. 416,541

12 Claims. (Cl. 101—415.1)

My invention relates to duplicating apparatus and particularly to an improved form of blackline duplicating apparatus employing a drum having a master sheet thereon in the form of a thin sheet of aluminum or the like upon which a suitable ink repellent may be spread for controlling the effective application of ink to the sheet by the ink mechanism. My present improvements are not however to be restricted to use in connection with this type of machine so far as they are applicable to other types of machines.

It is one of the objects of this invention to provide an improved arrangement of parts in a duplicating machine of this type for adjusting the parts for varying the size of the margin at the leading end of the copy sheet. For accomplishing this purpose, I have provided an improved mounting arrangement comprising a movable plate for holding the master sheet in position wrapped about a portion of the drum so that by an adjustment of the plate the master sheet is adjusted circumferentially of the drum. In the construction shown, the master sheet is held in position by clamping means carried by a plate extending across inside of the drum and adjustable edgewise with respect to the drum for effecting the desired circumferential adjustment of the master sheet.

I have provided also improved clamping means for releasably attaching the ends of the master sheet in position, so arranged that the master sheet can be easily manipulated for connecting it smoothly and tightly in position. In the construction illustrated in the drawings, the clamping means for the leading end of the master sheet is arranged so that it is normally maintained in holding position by springs and so that it may be moved by a single operating member into its open position and held by a past-center locking effect in such open position. In this construction, the clamping means for the opposite end of the master sheet is carried by a plate which is slidable edgewise toward and from the clamping means for said leading end of the sheet, the arrangement being such that the clamping means for said opposite end of the master sheet is movable into either its closed position or its open position when it is held at the limit of its motion away from the clamping means for the leading end of the sheet, and that such clamping means for said opposite end of the master sheet is held from either locking movement or unlocking movement when it is positioned at the limit of its motion toward said clamping means for the leading end of the sheet.

It is another object of this invention to improve devices of this type in sundry details hereinafter pointed out. The preferred means by which the several objects have been attained are illustrated in the accompanying drawings in which—

Fig. 1 is a vertical sectional view across the drum of a duplicating machine embodying the invention;

Fig. 2 is an inside face view of the section of the drum upon which the master sheet is mounted, the mounting arms for said portion of the drum being shown in section and some of the operating parts being omitted for clearness of illustration;

Figs. 3, 4 and 5 are sectional views taken substantially at the line 3—3, the line 4—4 and the line 5—5, respectively, of Fig. 2;

Fig. 6 is a view similar to Fig. 5 but showing a changed position of certain of the parts;

Fig. 7 is a detailed view taken substantially at the line 7—7 of Fig. 2 but with the master sheet held by the operator in changed position in the course of adjusting the sheet to the desired position; and

Fig. 8 is a detailed view of a fragmentary portion of the drum and master sheet substantially as seen at the line 8—8 in connection with Fig. 7.

This application is being filed as a division of my earlier application Serial No. 266,518, filed April 7, 1939.

Referring now to the several figures of the drawings, in which corresponding parts are indicated by the same reference characters, 10 indicates a heavy shaft in horizontal position for supporting a drum comprising two sections 11 and 12 mounted rigidly on the shaft with openings at opposite sides between the wall portions of the two sections.

In the arrangement shown, the drum section 11 is mounted on the shaft by means of end wall members or arms 13 and the drum section 12 is mounted by means of end wall members 14. The drum section 12 is of slightly smaller diametrical size than that of the drum section 11 and is provided with an ink pad 15 of any approved type wrapped about the face of the section.

Upon the drum section 11 of greater diameter I have provided means for mounting a master sheet 16 with its intermediate portion wrapped about the face of said larger drum section. For making the master sheet adjustable circumferentially with respect to the drum section I have connected the opposite end portions of the master

sheet with a plate 17 which extends across the drum and is adjustable edgewise with respect thereto. For adjustably mounting the plate 17 in position I have provided brackets 18 and 19 on the plate having slots 20 therein which are slidable upon shafts or bars 21 and 22 carried by said drum section 11 longitudinally thereof, as is clearly shown in Fig. 1. At about its middle point the plate 17 is provided with an opening 23 through which a lug 24 extends, such lug being mounted upon the inner face of the wall of said drum section 11. Upon the face of the plate 17 at one side of the opening 23 I have provided a bracket 25 in which an adjusting screw 26 is rotatably mounted, such adjusting screw 26 having a screw threaded connection with the inner end portion of the lug 24 for holding the plate 17 in adjusted position with respect to the drum section.

At the lower edge of the plate 17 in the position of the parts as shown in Fig. 3, I have provided a flange 27 extending at an angle with respect to the body of the plate. Upon the face of the plate above the flange 27 I have pivotally mounted a small plate 28 which is provided at its free edge with a flange 29 in position to cooperate with the flange 27 for gripping one end portion of the master sheet 16. In the arrangement shown the plate 28 is provided with a plurality of pins 30 extending through slots 31 in the plate 17, said pins having coiled springs 32 mounted thereon in position normally to hold the plate 28 moved to the limit of its motion in clockwise direction in said Fig. 3 so as to hold the flanges 27 and 29 in effective gripping position with respect to each other. In the construction illustrated the plate 17 is provided with lugs 33 at right angles to its face for limiting the movement of the master sheet 16 into gripping position between the flanges 27 and 29 so as to enable the operator easily to position the master sheet accurately. In the construction shown the plate 28 is also provided with a pivotally mounted lever or bracket 34 which stands normally in the position as shown in Fig. 3 but which is capable of being swung in counterclockwise direction in said Fig. 3 into a changed past-center position in which it is effective for holding the plate 28 swung toward the right in said Fig. 3 for permitting ready insertion of a master sheet between the flanges 27 and 29.

At the opposite edge of the plate 17, the top of the plate in the position in which the parts are shown in Fig. 3, I have provided a second flange 35 corresponding to the flange 27, such flange 35 however being mounted upon an auxiliary plate 36 slidably mounted upon the plate 17. The auxiliary plate 36 is provided with a narrow plate 37 pivotally mounted thereon and corresponding substantially to the plate 28 of the mechanism above described, such plate 37 being provided at its free edge with a flange 38 adapted to cooperate with the flange 35 for gripping the end of the master sheet 16. The plate 37 is provided with a plurality of pins 39 extending through slots 40 in the plate 17 and the auxiliary plate 36, springs 41 being provided on said pins for holding the plate 37 and its flange 38 normally in gripping relation to the flange 35. The plate 36 is also provided with stop lugs 42 corresponding to the lugs 33 of the arrangement at the opposite edge of the plate 17, such lugs 42 serving to limit the movement of the master sheet into position to be gripped. In the arrangement shown, the plate 36 is slidably mounted in position on the plate 17 by means of headed pins or rivets 43 carried by the plate 36 and working in slots 44 in the plate 17, as is clearly shown in Figs. 2 and 4. The plate 36 at one edge of the plate 17 is normally urged toward the opposite edge of said plate 17 by means of coiled springs 45 as is clearly shown in Figs. 2 and 3.

In my improved construction the plate 37 is pivotally mounted in position by means of flanges 46 formed integrally with the plate at its opposite ends. Said flanges are provided with large lugs 47 thereon, as is best shown in Fig. 6. In the position of the parts as illustrated in Figs. 2, 3, 4 and 5 the plate 37 is held against swinging movement on its pivotal axis by the engagement of the lugs 47 with the face of the plate 17. When it is desired that the plate 37 be swung outwardly away from the plate 17 into the position as shown in Fig. 6, the plate 37 is first moved edgewise toward the adjacent edge of the plate 17 against the action of the springs 45, this movement being effected by a pull on a handle 48 on said plate 37. This movement of the plate 37 serves to bring the lugs 45 into registration with slots 49 in the plate 17 so as to permit said plate to be swung in clockwise direction in said Fig. 6. When the lugs 47 have been carried completely through the slots 49, the pull on the handle 48 may be released for permitting the springs 45 to draw the plate 37 to the position as shown in said Fig. 6, in which position the lugs 47 serve to prevent return movement of the plate 37 by the springs 41 and 45.

In my improved construction the master sheet 16 is in the form of a thin flexible sheet of metal, preferably aluminum. When a master sheet of this type is to be mounted upon the drum, the parts are first brought to the position as shown in Fig. 6, whereupon one end portion of the master sheet is inserted between the flanges 35 and 38 into even engagement with the stops 42. The plate 37 is then manipulated for freeing the large lugs 47 from the slots 49 of the plate 17 so as to permit the springs 41 to move the plate 37 into position to grip the end of the master sheet as shown in Fig. 3. After the end of the master sheet 16 has been secured in position, the sheet is extended substantially horizontally above the drum portion 11 by the operator who then manipulates the set screw 26 by a suitable tool for bringing the graduations on the master sheet into the desired position with respect to the graduations on the drum section 11, as shown in Fig. 8. The master sheet is then wrapped smoothly about the drum section 11 and its leading end is inserted between the flanges 27 and 29, whereupon the plate 28 is moved into clamping engagement with the master sheet. The arrangement is such that the springs 45 serve effectively for tightening the master sheet about the drum section 11.

By the use of the improved arrangement as above described I am enabled very easily and quickly to apply a master sheet strongly in position upon the drum section 11 in the desired adjusted position with respect thereto. The clamping plates 28 and 37 serve to crimp the end portions of the master sheet about the flanges 27 and 35, respectively, so as to have a strong gripping hold upon the end portions of the master sheet so as to hold the master sheet effectively in position.

While the arrangement as above described is preferred, the invention is not to be limited to

such construction except so far as the claims may be so limited, it being understood that changes might well be made in the form and arrangement of the parts without departing from the invention.

I claim:

1. In a duplicating machine, the combination of a drum rotatably mounted in position, a plate movably mounted in said drum transversely thereof, means carried by said plate for releasably attaching thereto one end of a master sheet wrapped at least partially about said drum, other means carried by said plate for attaching the opposite end of said master sheet releasably thereto, and means for adjusting said plate with respect to the drum for changing the position of the master sheet circumferentially of the drum.

2. In a duplicating machine, the combination of a drum rotatably mounted in position, a plate adjustable edgewise in said drum transversely thereof, means carried by opposite edge portions of said plate for releasably attaching thereto the respective end portions of a master sheet wrapped at least partially about said drum, and means for holding said plate in adjusted position transversely of the drum for regulating the position of the master sheet circumferentially of the drum.

3. In a duplicating machine, the combination of a drum rotatably mounted in position, a bar mounted in said drum longitudinally thereof, a plate positioned transversely in said drum having brackets provided with slots parallel with the plate and engaging said bar for making the plate adjustable edgewise in the drum, means carried by said plate for releasably attaching thereto the respective end portions of a master sheet wrapped at least partially about the drum, and means for holding said plate in transversely adjusted position in the drum for regulating the position of the master sheet circumferentially of the drum.

4. In a duplicating machine, the combination of a drum rotatably mounted in position, a plate movably mounted in said drum transversely thereof, means carried by said plate for releasably attaching thereto one end of a master sheet wrapped at least partially about said drum, a second plate slidably mounted on said first-named plate, means carried by said second plate for releasably attaching the opposite end portion of said master sheet thereto, yielding means normally urging said second plate and the attaching means carried thereby toward said first-named attaching means, and means for adjusting said first-named plate with respect to the drum for changing the position of the master sheet circumferentially of the drum.

5. In a duplicating machine, the combination of a drum rotatably mounted in position, a plate movably mounted in said drum transversely thereof, means carried by said plate for releasably attaching thereto one end of a master sheet wrapped at least partially about said drum, a second plate slidably mounted on said first-named plate, means carried by said second plate for releasably attaching the opposite end portion of said master sheet thereto, yielding means normally urging said second plate and the attaching means carried thereby toward said first-named attaching means, and a screw connected with said first-named plate and said drum in approximately diametrical position with respect to the drum adapted by rotation to shift said plate for changing the position of the master sheet circumferentially of the drum.

6. In a duplicating machine, the combination of a drum rotatably mounted in position, a plate movably mounted in said drum transversely thereof, means carried by said plate for releasably attaching thereto one end of a master sheet wrapped at least partially about said drum, a second plate slidably mounted on said first-named plate, means carried by said second plate for releasably attaching the opposite end portion of said master sheet thereto, yielding means normally urging said second plate and the attaching means carried thereby toward said first-named attaching means, a lug projecting inwardly from the wall of the drum toward its axis, and a screw connected with said first-named plate and said lug adapted by rotation to shift said plate edgewise for changing the position of the master sheet circumferentially of the drum.

7. In a duplicating machine, the combination of a drum rotatably mounted in position, plate means provided with flange portions at opposite edges mounted in said drum transversely thereof, comparatively narrow plates pivotally mounted on said first-named plate means on axes extending longitudinally of the drum in position to have their edge portions stand in close proximity to the flanges of said first-named plate means, and spring means serving normally to hold said narrow plates pressed yieldingly against said first-named plate means for causing said plates to crimp and grip the opposite end portions of a master sheet having its intermediate portion wrapped about at least a portion of said drum.

8. In a duplicating machine, the combination of a drum rotatably mounted in position, plate means provided with flange portions at opposite edges mounted in said drum transversely thereof, comparatively narrow plates provided with flange portions at their free edges pivotally mounted on said first-named plate means on axes extending longitudinally of the drum in position to have their flange portions stand in close proximity to the flanges of said first-named plate means, spring means serving normally to hold said narrow plates pressed yieldingly against said first-named plate means for causing said several flanges to grip the opposite end portions of a master sheet having its intermediate portion wrapped about at least a portion of said drum, and lever means for one of said pivotally mounted plates adapted in a past-center turned position to hold said plate in spaced relation to said first-named plate means for expediting the connection of said master sheet to said first-named plate means.

9. In a duplicating machine, the combination of a drum rotatably mounted in position, a plate mounted in said drum transversely thereof and having a flange portion in angular relation to the body of the plate at one edge thereof, a second plate provided with a flange portion in angular relation to its body portion slidably mounted on the opposite edge portion of said first-named plate, comparatively narrow plates provided with flange portions at their free edges pivotally mounted on said first-named two plates respectively on axes extending longitudinally of the drum in position to have their flange portions stand in close proximity to the flanges on said first-named two plates, spring means serving normally to hold said last-named two plates pressed yieldingly against said first-named two plates for causing said several flanges to grip the opposite end portions of a master sheet having its intermediate portion wrapped about at least a portion of said drum, and spring means normally urging

said second plate along said first-named plate in the direction for tightening said master sheet.

10. In a duplicating machine, the combination of a drum rotatably mounted in position, a plate mounted in said drum transversely thereof and having a flange portion in angular relation to the body of the plate at one edge thereof, a second plate provided with a flange portion in angular relation to its body portion slidably mounted on the opposite edge portion of said first-named plate, comparatively narrow plates provided with flange portions at their free edges pivotally mounted on said first-named two plates respectively on axes extending longitudinally of the drum in position to have their flange portions stand in close proximity to the flanges on said first-named two plates, spring means serving normally to hold said last-named two plates for causing said several flanges to grip the opposite end portions of a master sheet having its intermediate portion wrapped about at least a portion of said drum, spring means normally urging said second plate along said first-named plate in the direction for tightening said master sheet, and means carried by the one of said pivotally mounted plates mounted on said second plate for locking said one plate in either its closed position or its open position.

11. In a duplicating machine, the combination of a drum rotatably mounted in position, a plate mounted in said drum transversely thereof and having a flange portion in angular relation to the body of the plate at one edge thereof, a second plate provided with a flange portion in angular relation to its body portion slidably mounted on the opposite edge portion of said first-named plate, comparatively narrow plates provided with flange portions at their free edges pivotally mounted on said first-named two plates respectively on axes extending longitudinally of the drum in position to have their flange portions stand in close proximity to the flanges on said first-named two plates, spring means serving normally to hold said last-named two plates pressed yieldingly against said first-named two plates for causing said several flanges to grip the opposite end portions of a master sheet having its intermediate portion wrapped about at least a portion of said drum, spring means normally urging said second plate along said first-named plate in the direction for tightening said master sheet, and means carried by the one of said pivotally mounted plates mounted on said second plate adapted by hooked engagement with said first-named plate to hold said one plate in its open position and adapted by engagement with said first-named plate in a changed position to hold said one plate in its closed position.

12. In a duplicating machine, the combination of a drum rotatably mounted in position, a plate movably mounted in said drum transversely thereof, means carried by said plate for releasably attaching thereto one end of a master sheet wrapped at least partially about said drum, other means carried by said plate for attaching the opposite end of said master sheet releasably thereto, means for adjusting said plate with respect to the drum for changing the position of the master sheet circumferentially of the drum, and graduations on said drum and the master sheet for indicating the adjustment of the master sheet with respect to the drum.

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