Oct. 30, 1945. C. H. BRADT 2,387,740

DUPLICATING MACHINE

Filed Dec. 23, 1942 3 Sheets-Sheet 1

Fig. 1

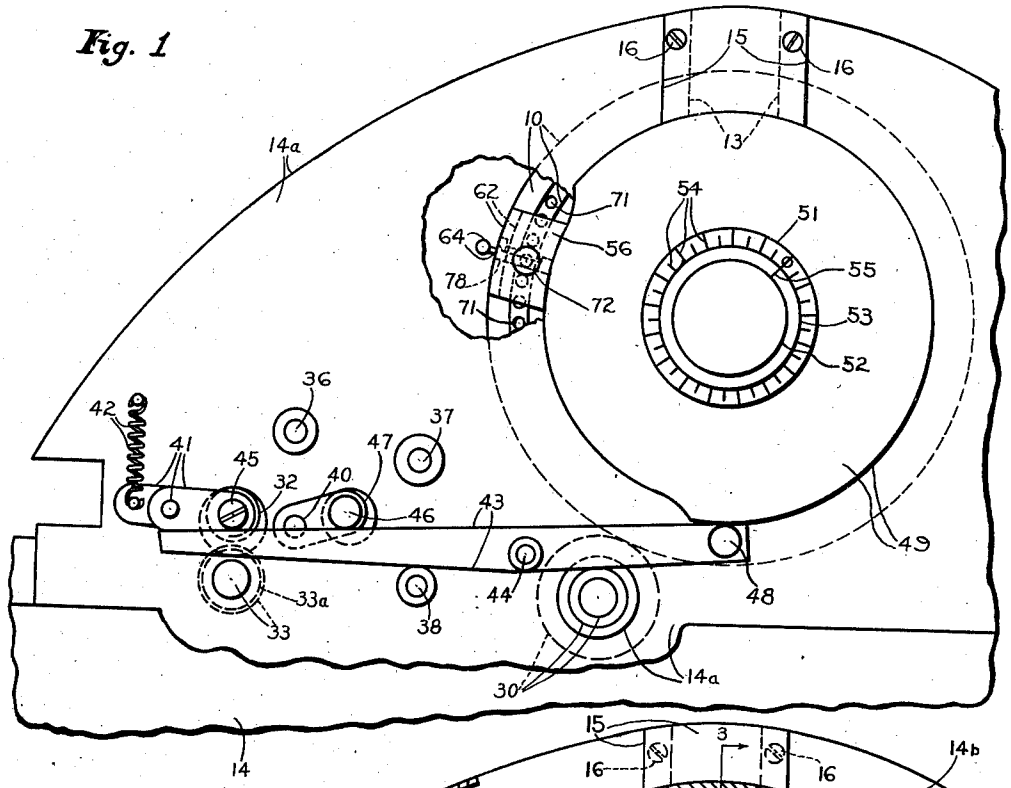
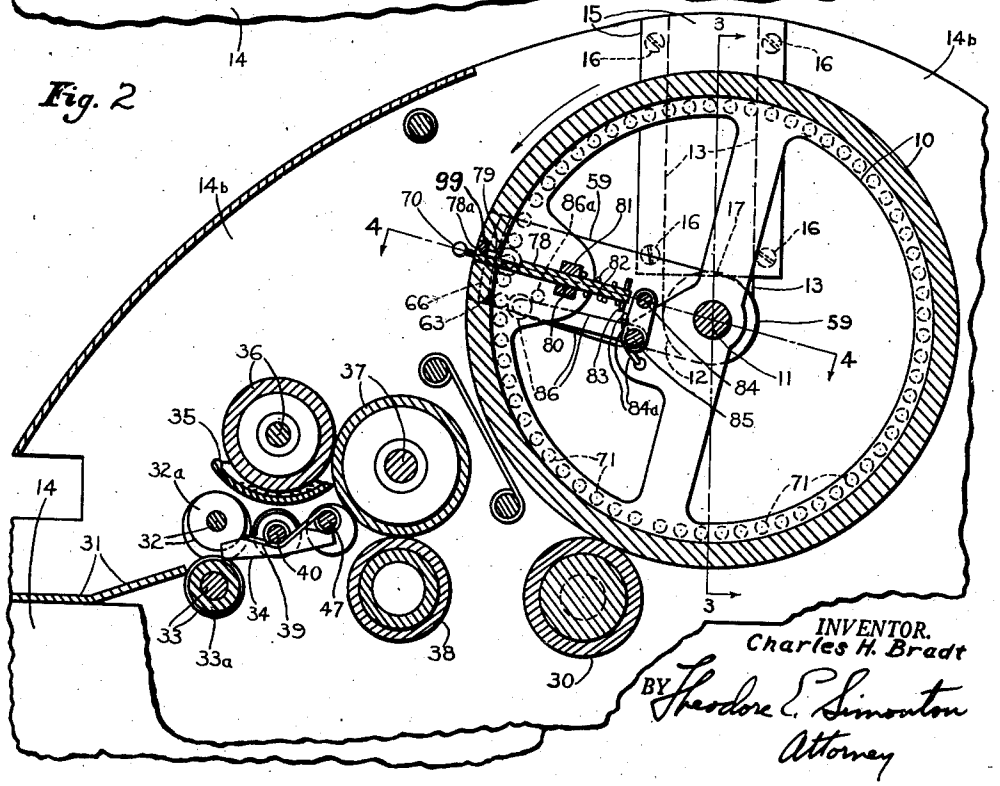


Fig. 2



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DUPLICATING MACHINE

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Fig. 3

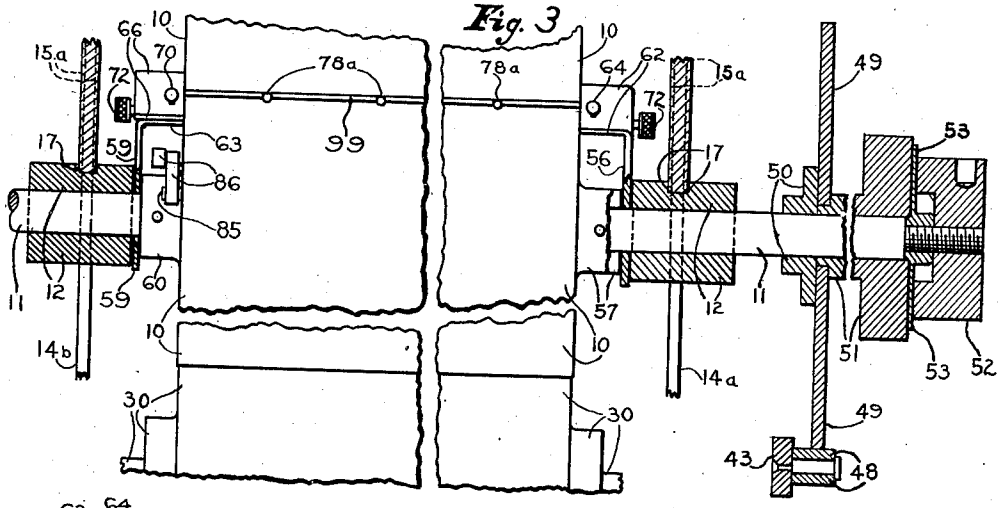


Fig. 4

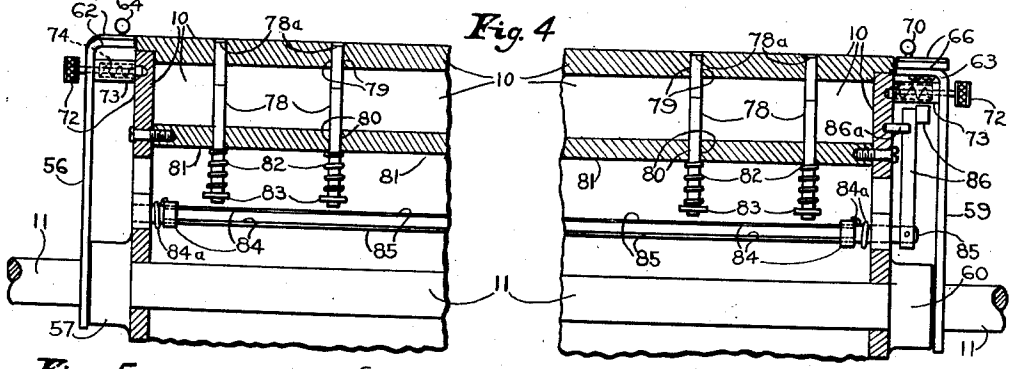


Fig. 5

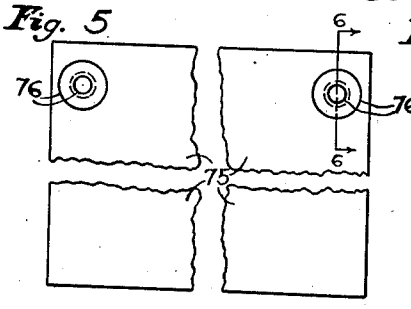


Fig. 6

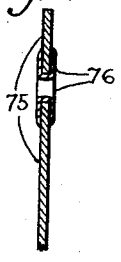


Fig. 7

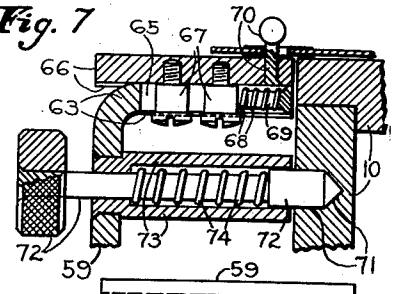


Fig. 9

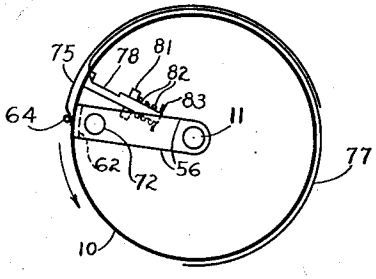
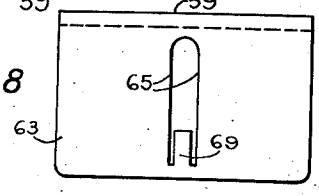


Fig. 8



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DUPLICATING MACHINE

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Fig. 10

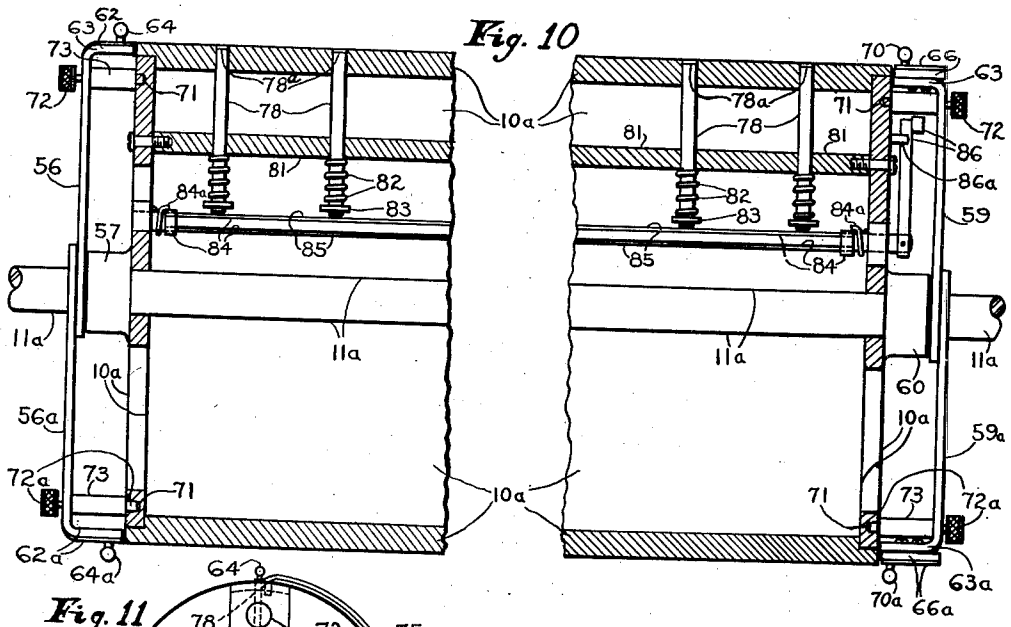


Fig. 11

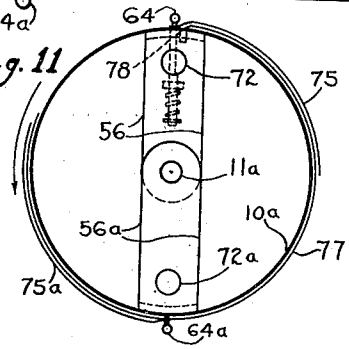


Fig. 13

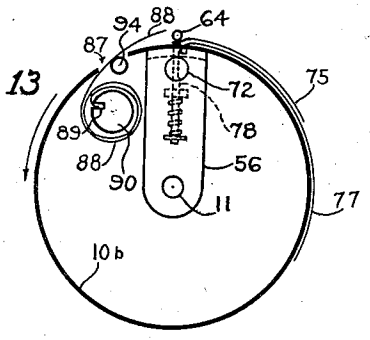
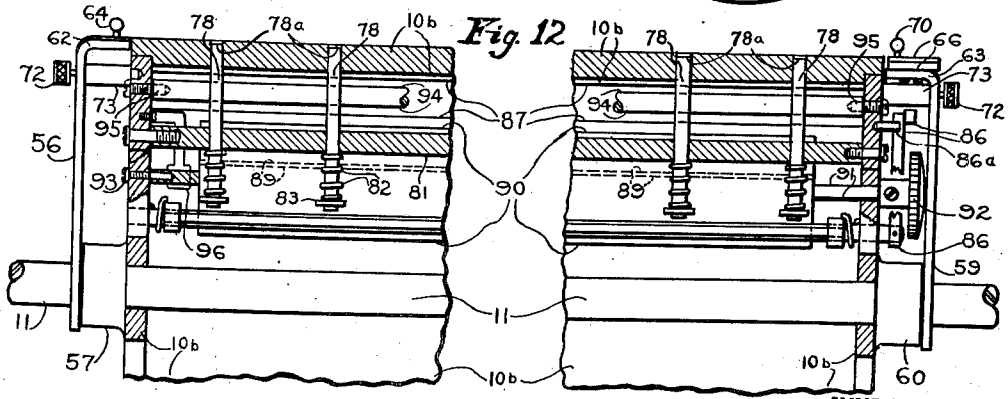


Fig. 12



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Patented Oct. 30, 1945

2,387,740

UNITED STATES PATENT OFFICE

2,387,740

DUPLICATING MACHINE

Charles H. Bradt, Groton, N. Y., assignor to L. C. Smith & Corona Typewriters, Inc., Syracuse, N. Y., a corporation of New York

Application December 23, 1942, Serial No. 469,878

17 Claims. (Cl. 101—132)

The invention relates to improvements in duplicating machines, and more particularly to improvements in duplicating machines for making copies by the liquid or spirit process of hectographic copying.

The principal objects of the invention are to provide, in a liquid process duplicator, simple and efficient means whereby copies may be taken from an entire master or from a selected portion or selected portions of the master, means whereby desired extents of a master may be blocked out from either or both ends of the master, means adjustable relatively to the master support to hold a master blocking out sheet positioned over different selected portions of a master on said support, means associated with the master carrying drum of a rotary liquid process duplicator for holding a master blocking out sheet to the drum at different selected points around the drum to rotate with the drum, means associated with the master carrying drum of a rotary liquid process duplicator for holding a plurality of master blocking out elements to the drum and effecting relative adjustments between said elements circumferentially of the drum, and means for holding a flexible blocking out sheet by one end thereof over the periphery of a master carrying drum and, preferably, adapted to hold said sheet tautened at said end longitudinally of the drum under the influence of spring force.

A further object is to provide a blocking out sheet of improved construction adapted for ready attachment to and detachment from holding means rotative with the master carrying drum of a liquid process duplicator of the rotary type.

Other objects and advantages of the invention will appear from the following description in detail of the several embodiments of the invention illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a fragmentary side elevation of one form of duplicating machine embodying the invention.

Figure 2 is a fragmentary vertical longitudinal sectional view taken substantially medially of the sides of said machine.

Figure 3 is a detail view partly in section on the line 3—3 of Figure 2.

Figure 4 is a detail view partly in section on the line 4—4 of Figure 2.

Figure 5 is a detail plan view, partly broken away, of a blocking out sheet or web element for said machine.

Figure 6 is a detail sectional view on the line 6—6 of Figure 5.

Figure 7 is a detail sectional view on the same line as Figure 4, but looking in the opposite direction, and showing part of the blocking out sheet anchoring means at the left hand end of the drum of the machine.

Figure 8 is a detail top plan view of the arm at the left hand end of the drum with the blocking out sheet anchoring pin and its supporting block detached.

Figure 9 is a diagrammatic view of the drum and associated master and blocking out sheet holding means of the construction shown in Figures 1 to 8, with master and blocking out sheets held to the drum.

Figure 10 is a view similar to Figure 4 showing a master sheet holding drum and associated blocking out sheet holding means which may be substituted for those of the construction shown in Figures 1 to 9, the modified construction having holding means for two blocking out sheets.

Figure 11 is a diagrammatic view of the modified construction of Figure 10 showing a master sheet and two blocking out sheets held to the drum.

Figure 12 is a view similar to Figure 4 showing a second modified assembly of master sheet holding drum and blocking out sheet and blocking out web holding means which may be substituted for the master sheet holding drum and blocking out sheet holding means of the construction shown in Figures 1 to 9.

Figure 13 is a diagrammatic view of the construction shown in Figure 12, showing a master sheet, a blocking out sheet and a roll or web of blocking out sheet material held to the drum.

The embodiment of the invention shown in Figures 1 to 9 will first be described.

A hollow master carrying and backing drum 10 extends transversely of the machine, said drum being formed of metal or other suitably rigid material and being fixed on an axial shaft 11. The shaft 11 is rotative in bearing sleeves 12 seated at the lower ends of vertical slots 13 formed in side walls 14a and 14b which are parts of the stationary framework 14 of the machine. Drum 10 is removably held in the machine frame by two retaining blocks 15 which are channeled along their vertical side edges at 15a to embrace said frame side walls along the vertical edges of slots 13 and are clamped to said walls by set screws 16 threaded in the blocks and bearing against said walls. At their lower ends the blocks are seated in channels 17 formed in and extend-

ing across sleeves 12 above shaft 11, said blocks thereby holding the sleeves against rotation and against axial movement.

In taking copies, the drum 10 is rotated counterclockwise as viewed in Figures 1 and 2 by any suitable hand or power driving means, such, for example, as is shown in United States patent to Flanigan, No. 2,185,188, granted January 2, 1940. A platen or counterpressure roll 30 is suitably journaled in the machine frame below drum 10 for coaction with the drum to feed a moistened copy sheet rearwardly between the drum and pressure roll in pressure contact with a master sheet carried by the drum. Preferably the mounting of roll 30 is that provided for the platen roll of the machine disclosed in said Flanigan patent.

While various means may be provided for delivering moistened copy sheets one at a time rearward into the bight of the drum and its counterpressure roll, the means shown, which is substantially like that disclosed in said Flanigan patent, is preferred. Said means will now be briefly described and reference may be had to said patent for a more detailed disclosure thereof.

Clear copy sheets are fed into the machine from a feed table 31 on the framework 14. Such sheets are introduced one at a time between a pair of introductory feed rolls 32—33 against sheet stop means 34 while roll 32 is lifted away from roll 33 and the sheet stop means 34 is in sheet stopping position, i. e., while these parts are positioned as shown in Figures 1 and 2. Preferably a plurality of the stops 34 is provided as in the machine of said patent. Rolls 32—33 have registering annular grooves 32^a—33^a to receive the forward end of each stop 34.

A supply of hectograph ink solvent is maintained in a trough 35 by suitable means. A roll 36 turning in the trough contacts a roll 37 which receives ink solvent from roll 36 and applies the solvent to the upper face of a copy sheet as the latter is fed rearward between roll 37 and an underlying counterpressure roll 38. Rolls 36, 37 and 38 are suitably journaled in the machine frame.

A spring 39 normally pivotally urges the stop 34 about a rock shaft 40 into sheet stopping position. Shaft 40 is journaled in walls 14^a—14^b and forms part of a rocking frame 40—47. Roll 32 is journaled in a rocking frame 41 which is journaled in walls 14^a—14^b, and a spring 42 acts on said frame to normally press roll 32 down toward roll 33. A lever 43, fulcrumed on the frame at 44, has one arm thereof engaged under a tappet 45 on frame 41 and under a tappet 46 on the rocking frame 40—47 to cause movement of stop 34 out of stopping position and lowering of roll 32 into contact with roll 33 once during each revoluttion of the drum 10. The other arm of lever 43 has thereon a cam follower 48 engaged under the periphery of a rotative cam disk 49 held to the drum shaft 11 to rotate with the drum.

Preferably the timing cam disk 49 is rotatively adjustable relatively to the drum through a complete circle about the drum axis by means similar to that disclosed in my application for United States patent filed March 19, 1942, Serial No. 435,383. The means shown for this purpose comprises a collar 50 fixed on drum shaft 11 and against which the inner face of cam 49 and the inner end of hub 51 of said cam are clamped by means of a nut 52. Nut 52 is threaded on a reduced end portion of shaft 11 and presses against the outer end of hub 51 a resilient metal disk 53 which is pinned to shaft 11. When the nut is loosened, the cam and its hub can be rotated relatively to the drum 10 and shaft 11 and disk 53. By tightening the nut, the cam is held to rotate with the drum. An annular row of graduations 54 is provided on the outer end of the cam hub, and a coactive graduation 55 is provided on the outer face of disk 53 to facilitate setting of the timing cam.

Suitable driving gearing (not shown), arranged as in the Flanigan patent above referred to, positively rotates the drum in the direction indicated by arrows on the drawings in taking copies, and positively drives rolls 33, 36 and 38 clockwise as viewed in Figure 2 during rotation of the drum.

The improvements will now be described.

An arm 56 is pivoted at one end thereof on shaft 11 between one end of the drum 10 and the adjacent frame side wall. An axial boss 57 formed on the drum abuts one face of said arm 56, and the other face of said arm is abutted by the adjacent end of the adjacent shaft bearing sleeve 12 to prevent shifting of arm 56 axially of shaft 11. An arm 59 is pivoted at one end thereof on shaft 11 between the other end of the drum 10 and the adjacent frame side wall. One face of arm 59 abuts an axial boss 60 formed on the drum, and the other face of said arm abuts the adjacent end of the adjacent shaft bearing sleeve 12, to thereby prevent shifting of arm 59 axially of shaft 11.

The arms 56 and 59 are rigid metal arms and extend radially of the drum. Arm 56 is formed at its outer end with arcuate lug 62 which projects inward toward the adjacent end of the drum adjacent the periphery of the drum, and arm 59 is formed with a similar arcuate lug 63 at its outer end which projects inward toward the adjacent end of the drum slightly closer to the drum axis than lug 62. A headed anchor pin 64 for a master blocking out sheet is rigidly affixed to lug 62 of arm 56 and extends outwardly from said lug radially of the drum adjacent and slightly beyond the drum periphery. Lug 63 of arm 59 is formed with a closed slot 65 which extends longitudinally of the drum. An arcuate plate 66 is slidably held on the outer face of lug 63 of arm 59 by two shouldered screws 67 which extend up through slot 65 and are threaded into plate 66. A coiled expansion spring 68 bears against the inner end of slot 65 and the innermost one of the screws 67 to normally urge the plate 66 outward from the adjacent end of the drum to the limit permitted by the closed slot 65. A retaining projection 69 on lug 63 constantly extends into the inner end of spring 68. A headed anchor pin 70 for a master blocking out sheet is rigidly affixed to plate 66 and extends outwardly from said plate radially of the drum adjacent and slightly beyond the drum periphery.

The two arms 56 and 59 are pivotally adjustable about the shaft 11 entirely around the latter. An annular series of closely spaced sockets 71 is formed in each end of the drum, and each of the arms is provided with a latch plunger 72 engageable in the sockets in the adjacent end of the drum to latch the arm in adjusted position to the drum to rotate with the drum. The plunger 72 carried by each arm is guided in and retained by a plunger housing 73 rigidly held to said arm, and said plunger is normally urged toward the drum into socket-engaging position by a spring 74.

A flexible master blocking out sheet 75 formed

of paper or other suitable material is detachably anchored at its leading end to the pins 64 and 70, said sheet being provided near opposite corners of its leading end with two eyelet-reinforced apertures 76 through which the heads of said pins are passed. The pins, being spring-urged apart longitudinally of the drum, will maintain the anchored end of the blocking out sheet stretched tautly longitudinally of the drum over the drum periphery. It will be understood that the arms are adjusted to positions in which the pins are directly opposed to each other longitudinally of the drum.

The master sheet 77 from which copies are to be taken may be held to the drum over the drum periphery by any suitable means for adjustment of the blocking out sheet 75 over the master sheet circumferentially of the drum.

The master sheet holding means shown will be briefly described. The leading end of the master sheet is releasably clamped to the drum by the heads 78ª of plungers 78, the shanks of which plungers are slidably guided in apertures 79 and 80 formed respectively in the cylindrical wall of the drum 10 and in a bar 81 fixedly carried by and extending longitudinally of the drum, and said plungers are guided to move radially of the drum. Springs 82, coiled around the plungers between bar 81 and abutments 83 on the plungers, normally urge the plungers inwardly to clamping position with their heads 78ª over a bar 99 which is countersunk in the periphery of the drum and extends longitudinally of the drum. The inner ends of the plungers are normally slightly spaced from the cross-rod of a bail 84, the side arms of which bail are fixed to a rock shaft 85 which extends longitudinally of the drum and is journaled in the ends of the drum. A handle 86 is fixed on shaft 85 externally of the drum for rocking said shaft at will to cause the cross-rod of the bail to engage the inner ends of the plungers and force the plungers outward to release the master sheet. The arm 59 and parts thereon are arranged to clear or pass handle 86 in adjusting arm 59. The bail is restored to normal position against a stop 86ª on the drum by torsion springs 84ª.

It will be observed that by adjustments of the arms 56 and 59 the blocking out sheet may be adjusted around the drum to progressively block out the master from either end, to block out a selected end portion at either end of the master, or to block out any selected intermediate portion of the master, it being understood that a blocking out sheet of any desired length within the limit of the circumferential dimension of the drum may be anchored to the arms. If desired, a blocking out sheet, provided with one or more apertures for exposing one or more selected parts of a master through the blocking out sheet, may be anchored to the pins on said arms, instead of an imperforate blocking out sheet.

In the second embodiment of the invention shown in Figures 10 and 11, there is illustrated a master sheet holding drum 10ª with blocking out sheet holding means associated therewith, for substitution for those above described in the machine illustrated in Figures 1 to 9.

In this second embodiment of the invention the construction is in all respects like that of the first described embodiment of the invention except that an additional pair of arms 56ª—59ª is pivotally mounted on drum shaft 11ª and confined together with arms 56—59 between the respective bearing sleeves 12 and drum bosses 57—60. Lug 62ª of arm 56ª has rigidly fixed thereto a headed anchor pin 64ª. Lug 63ª of arm 59ª has a plate 66ª slidably held thereto in the same way as plate 66 on arm 59, said plate 66ª being spring urged outward from the adjacent drum end in the same manner and by means like that acting on plate 66. A headed anchor pin 70ª is rigidly affixed to plate 66ª. Each arm 56ª—59ª has a spring pressed latch plunger 72ª mounted thereon for releasable engagement with any selected socket of the annular series of sockets 71 in the adjacent end of the drum. Provision is thus made for anchoring two blocking out sheets 75—75ª to travel with the drum, and for effecting relative adjustments between said sheets circumferentially of the drum relatively to master sheet 77 and to each other. By this arrangement, opposite end portions of a master may be blocked out simultaneously and the extent of each blocked out end portion may be varied independently of that of the other blocked out end portion.

In the third embodiment of the invention illustrated in Figures 12 and 13, there is shown a master sheet holding drum 10ᵇ with another arrangement of blocking out element holding means associated therewith for substitution for those of the machine illustrated in Figures 1 to 9.

In this third embodiment of the invention the construction is in all respects like that of the first described embodiment of the invention except that the drum 10ᵇ is provided with a gap or slot 87 in its cylindrical wall, which gap extends longitudinally of the drum substantially the full length of the drum slightly in advance of the master clamping means, and said drum is provided, in addition to the blocking out sheet holding means of said first embodiment, with means for supporting a roll or long web 88 of blocking out material within the drum and for reeling said material variably in and out through said gap.

The web of blocking out material 88 has one end thereof detachably engaged in a longitudinal slot 89 in a spindle 90. Spindle 90 extends longitudinally of the drum within the drum adjacent gap 87. A reduced end portion 91 of the spindle extends through and is journaled in an end portion of the drum and has a finger wheel 92 detachably fixed on its outer end externally of the drum. At its other end the spindle is journaled on a pivot screw 93 threaded through an adjacent end portion of the drum. A guide roll 94 for the web 88 is journaled at 95 on the drum and extends longitudinally of the drum within the drum opposite and close to gap 87.

Provision is thus made in the third embodiment of the invention for separately anchoring a blocking out sheet 75 and a long blocking out web 88 to the drum and for effecting adjustments of each of the blocking out elements independently of the other relatively to the drum. The web 88 may be reeled or adjusted to render it entirely ineffective during use of the machine without removing it from the machine. This web 88 may be adjusted to cover different linear extents of the master from the master clamp, and sheet 75 may be adjusted to cover a separate fixed linear extent of the master beyond the free end of the web 88 leaving any desired linear extent of the master exposed between the free end of the web 88 and the adjacent end of sheet 75. The sheet 75 may be ad-

justed to block out different extents of the master from the free end of the master, and the web 88 may be adjusted to block out different extents of the master from the anchored end of the master. The web 88 also may be used to cover all of that portion of the master which would otherwise be exposed between the anchored end of sheet 75 and the anchored end of the master in different adjusted positions of sheet 75. The sheet 75 may be readily installed and removed for use of the web alone or of the web and sheet conjointly, and the web 88 may be retained in the machine for use alone, for use in conjunction with the sheet 75, or for non-use at desired times. As the free end portion of the web 88 becomes worn it may be torn or cut off.

Any suitable means may be provided for insuring against possible accidental rotation of spindle 90. The means shown comprises a spring arm 96 fixed adjacent one end thereof to the drum and pressing adjacent its free end against a reduced end portion of spindle 90, thus providing a friction brake for the spindle.

I claim:

1. Master carrying and blocking out means for a rotary duplicator of the liquid process type comprising, in combination, a master carrying and backing drum provided with means to hold a master to the drum for revolution of the master with the drum with the master held for backing of at least a portion of the master by the periphery of the drum, and means associated with said drum for holding a master blocking out element to the drum at any of a plurality of selected positions spaced around the drum axis adjacent the periphery of the drum to permit adjustment of the blocking out element bodily about the periphery of the drum over the drum backed portion of a master held to the drum.

2. Master carrying and blocking out means for a rotary duplicator of the liquid process type comprising, in combination, a master carrying and backing drum, blocking out element holding means adjustable relatively to the drum about the axis of the drum, and means for releasably holding said blocking out element holding means to the drum in different adjusted positions to rotate with the drum.

3. Master carrying and blocking out means for a rotary duplicator of the liquid process type comprising, in combination, a master carrying and backing drum, and means for holding a plurality of master blocking out sheets over the periphery of the drum to rotate with the drum and for effecting relative adjustments between said sheets circumferentially of the drum at will.

4. In a duplicator of the liquid process type having a rotatively mounted master holding and backing drum, the combination with the drum of a pair of arms mounted adjacent opposite ends of the drum for manual swinging adjustments of said arms about the axis of the drum, means for releasably holding said arms in adjusted position to said drum to turn with the drum, and means carried by each arm adjacent the periphery of the drum for releasably holding a master blocking out sheet to said pair of arms.

5. In a duplicator of the liquid process type having a rotatively mounted master holding and backing drum, the combination with the drum of a plurality of arms adjacent each end of the drum each supported at one end for swinging adjustments thereof about the drum axis, means for releasably holding said arms in adjusted position to said drum to turn with the drum, and means carried by each arm adjacent the periphery of the drum for releasably holding a master blocking out sheet to the arm.

6. A liquid process duplicator of the kind having a rotatively mounted master carrying drum, characterized in that there is associated with the drum means for holding a master blocking out sheet to rotate with the drum with said sheet located in its entirety externally of the drum periphery, which means is adjustable relatively to the drum entirely around the axis of the drum to vary the position of said sheet around the drum periphery.

7. In a liquid process duplicator, the combination of a rotatively mounted master carrying drum, and means for supporting two master blocking out elements over the periphery of the drum for rotation with the drum and for varying at will the spacing circumferentially of the drum between one end of one of said elements and the adjacent end of the other one of said elements.

8. In a liquid process duplicator, the combination of a rotatively mounted master carrying drum, anchorage means for a blocking out sheet adjustable circumferentially of the drum, means for releasably holding said anchorage means to the drum in different adjusted positions to rotate with the drum, said drum having means for holding a master on the drum periphery by one end of the master, said drum having a gap therein extending longitudinally thereof in advance of said master holding means, and means within said drum for supporting a roll of blocking out material for variable reeling and unreeling of said material through said gap in the drum.

9. In a duplicator, the combination of a rotatively mounted master carrying drum, and means spaced apart longitudinally of the drum and located adjacent opposite ends of the drum for holding a flexible master blocking out sheet suspended therebetween to rotate with the drum in master covering relation to the drum, said means including provisions for constantly exerting a tautening effort longitudinally of the drum on a flexible blocking out element held by and suspended between said means.

10. In a liquid process duplicator, the combination of a rotatively mounted master carrying drum, a pair of independent anchor devices at opposite ends of the drum adjacent the drum periphery for anchoring a flexible master blocking out sheet over a master carried by the drum, means for releasably holding said anchor devices to the drum at different points around the drum axis, and means constantly resiliently urging one of said anchoring devices outwardly from the adjacent end of the drum.

11. In a liquid process duplicating machine, the combination of a rotatively mounted drum, a counterpressure roll coactive with said drum, means for holding a master to the drum with the master backed by the periphery of the drum, said drum being rotative in one direction to feed a copy sheet between the drum and counterpressure roll in contact with a master on the drum, copy sheet feeding and moistening means variably settable for delivery of one moistened copy sheet in the bight of the drum and counterpressure roll per revolution of the drum and at a time when the leading end of a master on the drum is at any selected point relatively to said bight, and means associated with the drum for holding a master blocking out sheet to the drum at any of a plurality of selected points around the drum axis.

12. In a liquid process duplicating machine, the combination of a rotatively mounted drum, a counterpressure roll coactive with said drum, means for holding a master to the drum with the master backed by the periphery of the drum, said drum being rotative in one direction to feed a copy sheet between the drum and counterpressure roll in contact with a master on the drum, copy sheet feeding and moistening means variably settable for delivery of one moistened copy sheet into the bight of the drum and counterpressure roll per revolution of the drum and at a time when the leading end of a master on the drum is at any selected point relatively to said bight, and means for holding a plurality of master blocking out sheets over the periphery of the drum to rotate with the drum and for effecting relative adjustments between said sheets circumferentially of the drum.

13. In a liquid process duplicating machine, the combination of a rotatively mounted drum, a counterpressure roll coactive with said drum, means for holding a master to the drum with the master backed by the periphery of the drum, said drum being rotative in one direction to feed a copy sheet between the drum and counterpressure roll in contact with a master on the drum, copy sheet feeding and moistening means variably settable for delivery of one moistened copy sheet into the bight of the drum and counterpressure roll per revolution of the drum and at a time when the leading end of a master on the drum is at any selected point relatively to said bight, means for supporting a blocking out sheet over the drum periphery for rotation with the drum with said sheet located in its entirety exteriorly of the drum, said drum having a gap therein extending longitudinally thereof, and means for supporting a roll of blocking out material within said drum for reeling and unreeling of said material through said gap at will.

14. In a liquid process duplicator having a rotatively mounted drum provided with means coactive with one end of a master sheet for holding the latter to the drum with said sheet backed by the periphery of the drum, the combination with said drum of a pair of anchor pins for a master blocking out sheet, and means for supporting said pins at opposite ends of the drum at different selected points around the drum axis to rotate with the drum with said pins located adjacent the periphery of the drum and extending from their supporting means substantially radially of the drum.

15. In a liquid process duplicator having a rotatively mounted drum provided with means coactive with one end of a master sheet to hold the latter to the drum with said sheet backed by the periphery of the drum, the combination with said drum of an anchor pin for a blocking out sheet, means at one end of said drum for supporting said pin in fixed relation to the drum at selected points around the drum axis with said pin adjacent the periphery of the drum and extending from its supporting means substantially radially of the drum, a second anchor pin for said blocking out sheet, means at the opposite end of the drum for supporting said second pin at selected points around the drum axis for limited movement longitudinally of the drum with said pin adjacent the periphery of the drum and extending from its supporting means substantially radially of the drum, and spring means constantly urging said second pin outward from the adjacent end of the drum.

16. In a liquid process duplicator, a frame, a drum having a shaft journaled in said frame, a counterpressure roll coactive with said drum, said drum having means for holding a master by one end thereo to the drum with the master backed by the periphery of the drum, a pair of arms at opposite ends of the drum each pivoted at one end thereof on the drum shaft, means restraining said arms from movement longitudinally of the shaft, means carried by said arms at their outer ends adjacent the drum periphery for sheet-anchoring engagement with one end of a master blocking out sheet, said drum having in each end thereof an annular series of sockets concentric with the drum shaft, and spring-pressed latch plungers, one carried by each arm, for engagement in any selected socket of the adjacent series of sockets in the drum, to constrain the arms to turn with the drum.

17. In a liquid process duplicator, a frame, a drum having a shaft journaled in said frame, a counterpressure roll coactive with said drum, said drum having means for holding a master by one end thereof to the drum with the master backed by the periphery of the drum, a pair of arms at opposite ends of the drum each pivoted at one end thereof on the drum shaft, means restraining said arms from movement longitudinally of the shaft, means carried by said arms at their outer ends adjacent the drum periphery for sheet-anchoring engagement with one end of a master blocking out sheet, said drum having in each end thereof an annular series of sockets concentric with the drum shaft, spring-pressed latch plungers, one carried by each arm, for engagement in any selected socket of the adjacent series of sockets in the drum, to constrain the arms to turn with the drum, and copy sheet feeding and moistening means settable for delivery of one moistened copy sheet into the bight of the drum and counterpressure roll per revolution of the drum and at a time when the held end of the master is at any selected point in its transit to said bight.

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