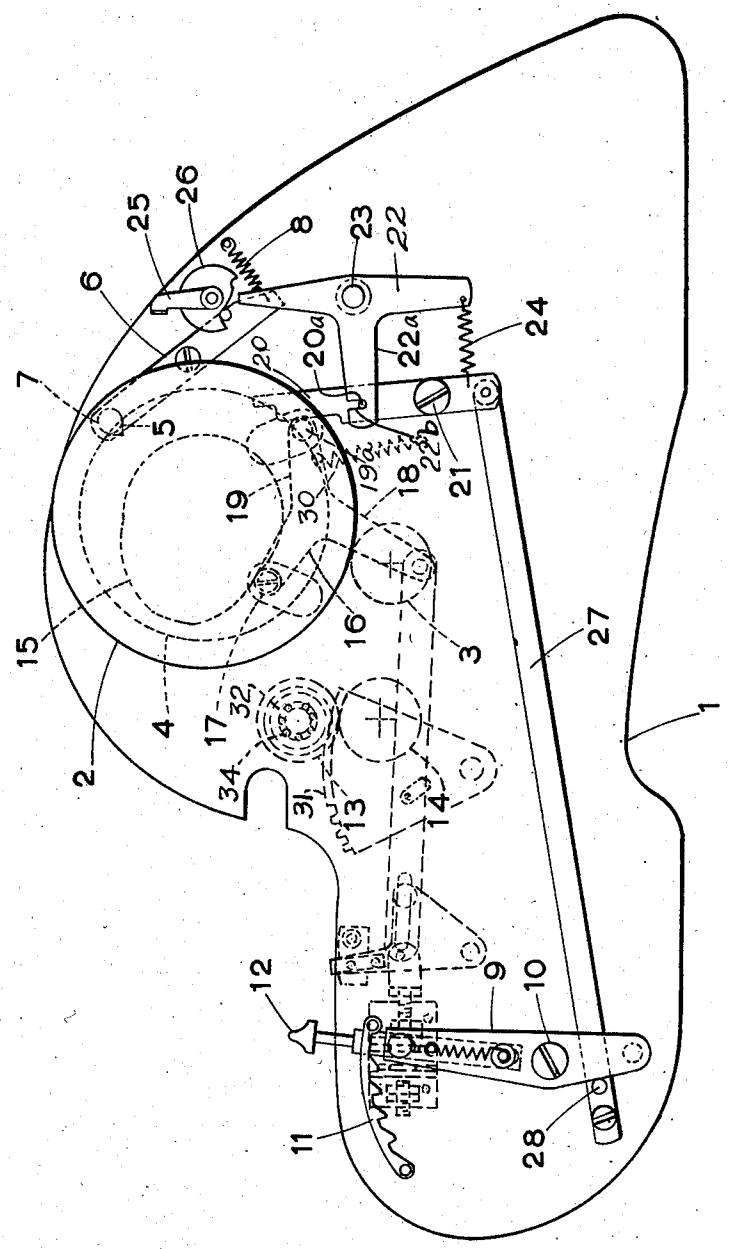
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SHEET FEED CONTROL MEANS FOR ROTARY HECTOGRAPHIC COPYING MACHINES

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SHEET FEED CONTROL MEANS FOR ROTARY HECTOGRAPHIC COPYING MACHINES

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This invention relates to copying machines of the kind in which the sheet on which the copy is to be made is fed by means of a pair of feed rollers to the printing position in which the sheet passes between a drum carrying the hectographic master to be copied and a co-operating pressure roller, the feed rollers being driven from the rotation of the drum during the initial movement of the drum from its rest position and thereafter being entrained by the copy sheet as it is fed forward by the co-operating drum and pressure roller. An example of such a machine is to be found in British Patent 682,842. In such machines, the solvent used for moistening the copy sheet on its passage to the drum may conveniently be applied by way of the upper feed roller. Usually the drum is releasably located in its rest position by means of a spring-loaded arm carrying a roller or other cam follower adapted to engage in a dwell on a cam, the cam being mounted to rotate with the drum and the arm being pivoted to the stationary frame of the machine.

Normally the machine is used to copy from a master of a length less than the periphery of the drum so that each rotation of the drum from rest position to rest position corresponds to a complete copying operation. Sometimes however it is necessary to take copies from a master sheet of greater length than the periphery of the drum, so that the drum has to make more than one revolution to enable a copy to be made, and after each copying operation the drum has to be rotated in reverse to unwrap the master sheet so that a further copying operation can be performed. During this reverse rotation there is no copy paper between the master and the pressure roller and it is desirable therefore that the pressure between the roller and the drum should be released. It is also desirable that the drum locating device should be inoperative during the copying operation.

According to the present invention means are provided whereby after the first rotation of the drum, the drive to the feed rollers can be interrupted automatically so that the feed rollers are driven only while the copy sheet is engaged exclusively by said feed rollers. If the drive of the feed rollers is derived from a cam follower co-operating with a cam rotating with the drum, the interruption of the drive may be effected by a latch member adapted to retain the follower in an extreme throw position so that it is not oscillated by the cam. The latch member may be spring loaded and normally retained in an inoperative position against the spring-loading but released by an operator-controlled lever when it is desired to take "long" copies. The same lever may also serve to control the drum locating arm to render the drum locating device inoperative.

Thus when the operator-controlled lever is set to the position for "long" copies, the spring-loaded latch member is released and when the cam-follower from which the feed roller drive is derived reaches its extreme throw position, the latch member engages it to hold it stationary so that no further feed motion is imparted to the feed rollers. When the long copy has been taken, the pressure of the pressure roller is released to enable the drum to be reversed to unwrap the master therefrom. The pressure control is linked to the latch so that the latter is tripped by the action of releasing the pressure. For this purpose, the pressure control lever may engage a stud or like projection on a link hinged to latch member, so that release of pressure causes the control lever to engage the stud to move the link and thereby trip the latch. Movement of the pressure control lever in the opposite sense to apply pressure is independent of the link.

The arrangement for disabling the drum locating device is preferably such that the reverse rotation of the drum trips it, so that the drum is located again when it reaches its original starting position. On the next "long" copying operation, the drum locating device is again held out of operative position as soon as the drum has moved out of its rest position.

When the machine is set for normal operation a catch positioned by the operator-controlled lever is in a position to engage and hold the latch member in an inoperative position.

In order that the invention may be more readily understood and carried into effect, an embodiment will be described with reference to the accompanying drawing, which is a view looking at the inside of the left-hand side frame of a hectographic copying machine, and which shows in detail only those parts of the machine which are modifications of or additions to an existing machine constructed according to British Patent 682,842.

The left-hand side frame is indicated at **1**. Journalled in the side frame are a printing drum **2** on which is secured a master sheet bearing in mirror script in hectographic ink the matter to be reproduced, and a co-operating pressure roller **3**. The drum **2** is located in its rest position by means of a cam **4** secured for rotation with the drum **2** and provided with a dwell **5**. A roller **7** carried by a locating arm **6** pivoted on the side frame **1** is urged by a spring **8** to bear against the edge of the cam **4** and by engagement in the dwell **5** releasably locates the drum **2** in its rest position. For the copying operation, the pressure roller **3** is urged against the drum **2**, the pressure being adjustable in well-known manner by means of a lever **9** for instance, by mechanism similar to elements 4 to 21 inclusive in British Patent No. 604,565 in which the pressure of roller **4** on roller **1** is controlled.

In the position of the lever **9** as shown, the pressure is "off," and pressures of progressively increasing magnitude are obtained by rocking the lever **9** counter-clockwise about its pivot **10**. The lever **9** is held in its adjusted position by means of a rack quadrant **11** from which it can be released be depressing the knob **12**. The movement of the lever **9** controls in well-known manner the position of a cam which controls the thrust of a spring arrangement **30** provided for urging the pressure roller 3 against the drum **2**. The copy sheets on which the copies are to be obtained, are fed singly to the printing couple **2**, **3** by a pair of feed rollers **13**, **14** the feed movement of which is derived from the rotation of the drum **2**. For this purpose a cam **15** is associated with the drum so that a rocker **16** provided with a follower roller **17** is oscillated by the rotation of the drum. A spring **30** engages the arm **19** of the rocker **16** and holds the cam follower roller **17** in engagement with the cam **15**. In the manner more fully described in British Patent No. 682,842 the movement of the dependent arm **18** of the rocker **16** may be transmitted to a toothed sector **31** meshing with a toothed wheel **32** which is coupled with the drive for the feed rollers **13**, **14** by way of a unidirectional coupling **34**, so that the feed rollers are driven during movement of the sector in one direction, but not in the other. The copy sheets are moistened

with with a solvent for the hectographic ink as they are fed to the printing couple. This moistening may be effected in any convenient way, as for example by supplying the moistening solvent to the upper feed roller.

In normal operation of the machine, the feed rollers 13, 14 are operative during each rotation and the drum is releasably located in its rest position at the end of each rotation.

To enable "long" copies to be taken from master sheets which are longer than the periphery of the drum 2, the mechanisms which will now be described are provided.

Pivoted at 21 to the side frame 1 is a latch 20 the upper end of which is adapted to engage below a pin 19*a* on the arm 19 when the rocker 16 is in its extreme throw position determined by the cam 15. When the latch 20 engages below the pin 19*a* and supports the arm 19, the rocker 16 cannot follow the cam contour and remains stationary so that no further feed movement is imparted to the feed rollers 13, 14. During "normal" operation, the latch 20 is held inoperative by a catch 22 pivoted to the side frame at 23. Catch 22 is comprised in part by an arm 22*a* provided in its upper surface with an open ended slot 22*b*, into which a pin 20*a* on arm 20 is adapted to engage. A spring 24 extending between latch 20 and catch 22 tends to urge the upper end of the latch 20 into the position in which it locks the rocker 16. For taking "long" copies, the operator moves a control lever 25 in clockwise direction, thereby simultaneously turning the associated cam 26 in the same direction. This movement of the cam 26 causes the catch 22 to turn counterclockwise about its pivot 23, thereby releasing the latch 20. At the same time, the cam 26 rocks the arm 6 to lift the roller 7 out of the dwell 5 in the locating cam 4. Then, when the copying operation is commenced, the rocker 16 is rocked and the feed rollers are operated during the first rotation of the drum 2. However, as soon as the rocker 16 reaches its maximum throw, the latch 20 can engage below the pin 19*a* on the arm 19 of the rocker 16 to hold the latter against further movement. Rotation of the drum can then be continued the requisite number of times to complete the "long" copying operation. At this stage, the "long" master is wrapped round the drum 2 and it must be unwrapped before a further copying operation can be performed. The first step is to release the pressure by moving the pressure control lever 9 into the "off" position as shown in the drawing. This movement of the lever 9 is utilized to withdraw the latch 20 from the rocker 16. This is achieved by means of a link 27 attached to the lower end of the latch 20 and provided with a pin 28 in the path of movement of the lower end of the lever 9.

If the lever 25 has been restored to the position shown in the drawing, the catch 22 re-engages the latch 20 as shown and "normal" copying can take place. If however the lever 25 has been left in the "long" position, then the catch 22 is maintained out of engagement with the latch 20 and the cycle of operations for taking "long" copies can be repeated after restoring the lever 9 to the position appropriate to the desired pressure between pressure roller 3 and drum 2.

I claim:

1. In a copying machine a copy-printing drum, rollers for feeding sheets to said drum, drive means for said rollers connected to be driven from said drum, and selectively operable means controlled by rotation of said drum functioning after a predetermined rotation thereof to disconnect the feeding means drive from said drum after the first revolution of said drum whereby after said first rotation of the drum the drive to said feed rollers is interrupted automatically, so that the feed rollers are driven only while the copy sheet is engaged exclusively by the said feed rollers.

2. A machine as claimed in claim 1 and in which the the drive connection between the feed rollers and drum includes a cam rotating with the drum, and a cam follower engaging said cam and oscillated thereby, said follower being connected to drive said rollers by its oscillation, and in which a latch member is provided which is adapted to retain said follower in an extreme throw position for effecting the interruption of said rollers drive.

3. A machine according to claim 2 and in which said latch member is movable from said follower-retaining position to an inoperative position, a spring for engaging and loading said latch member in inoperative position, and a catch normally engaging said latch member and retaining it in inoperative position.

4. A machine according to claim 3, and in which a pressure roller is provided pressing against said drum, means for controlling the pressure between said pressure roller and drum, said pressure controlling means being connected with said latch so that on movement the said controlling means into the pressure "off" position, the latch member, if previously in its operative position, is moved into its inoperative position.

5. A machine as claimed in claim 1 and an operator-actuated lever for controlling the operation of the drive interrupting means, means for locating said drum in its rest position, said lever being connected with said drum locating means to render said locating means ineffective by its movement into the drive interrupting setting.

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