

[54] **FORMS REPRODUCTION APPARATUS**

3,373,440 3/1968 Jenkins et al. .... 346/107

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**355/75**

[51] Int. Cl. .... **G03g 15/00**

[58] Field of Search ..... **95/1.1; 355/8, 11,**  
**355/75**

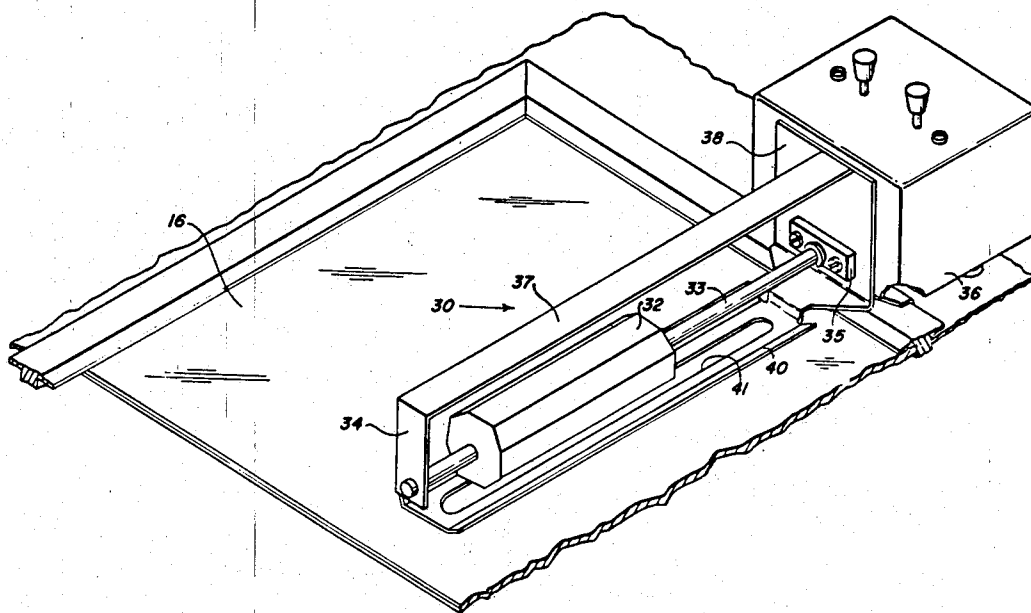
[57] **ABSTRACT**

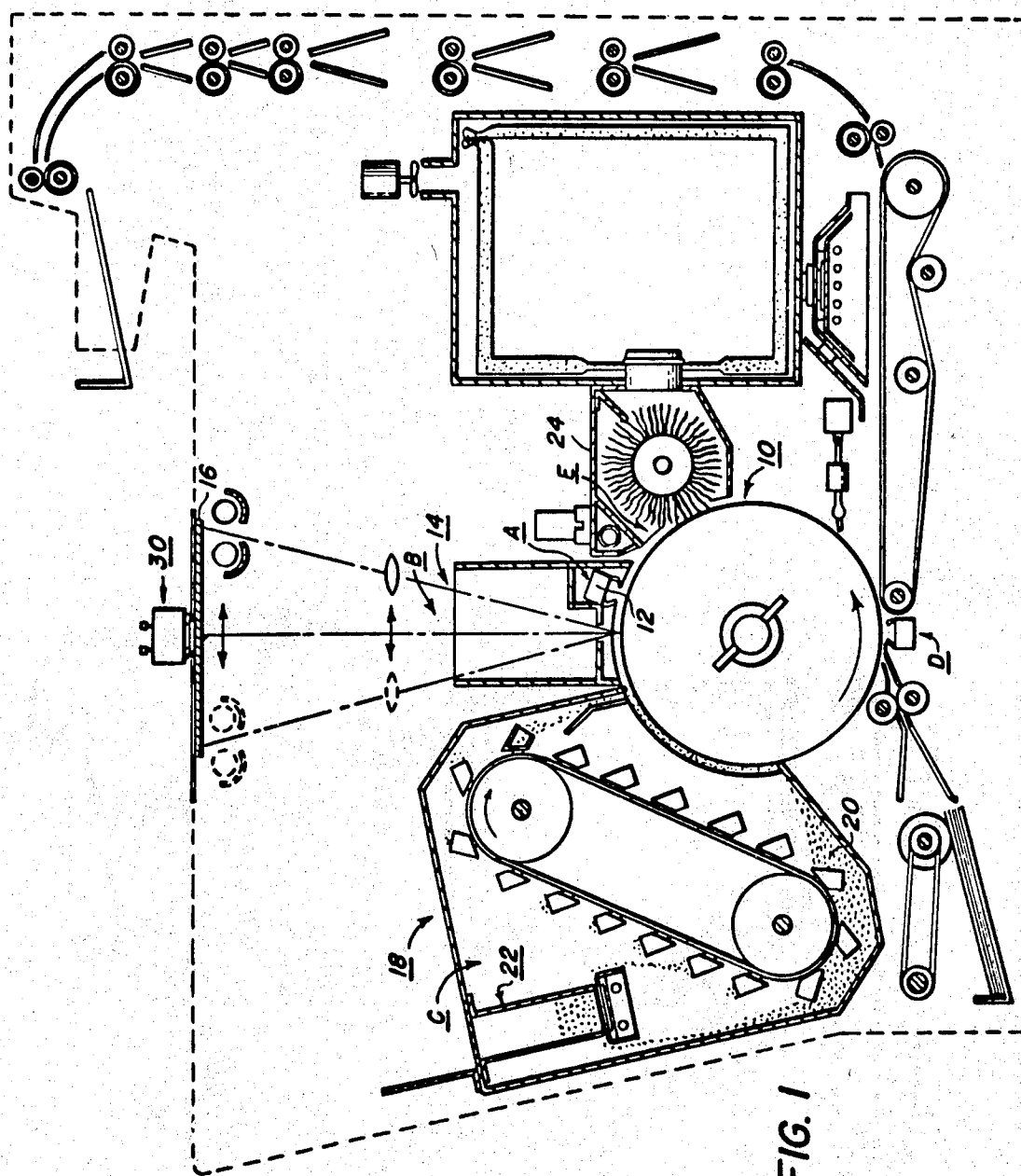
An imprinter arranged to cooperate with a copying machine for producing copies of an original wherein each copy will bear variable information provided by the imprinter.

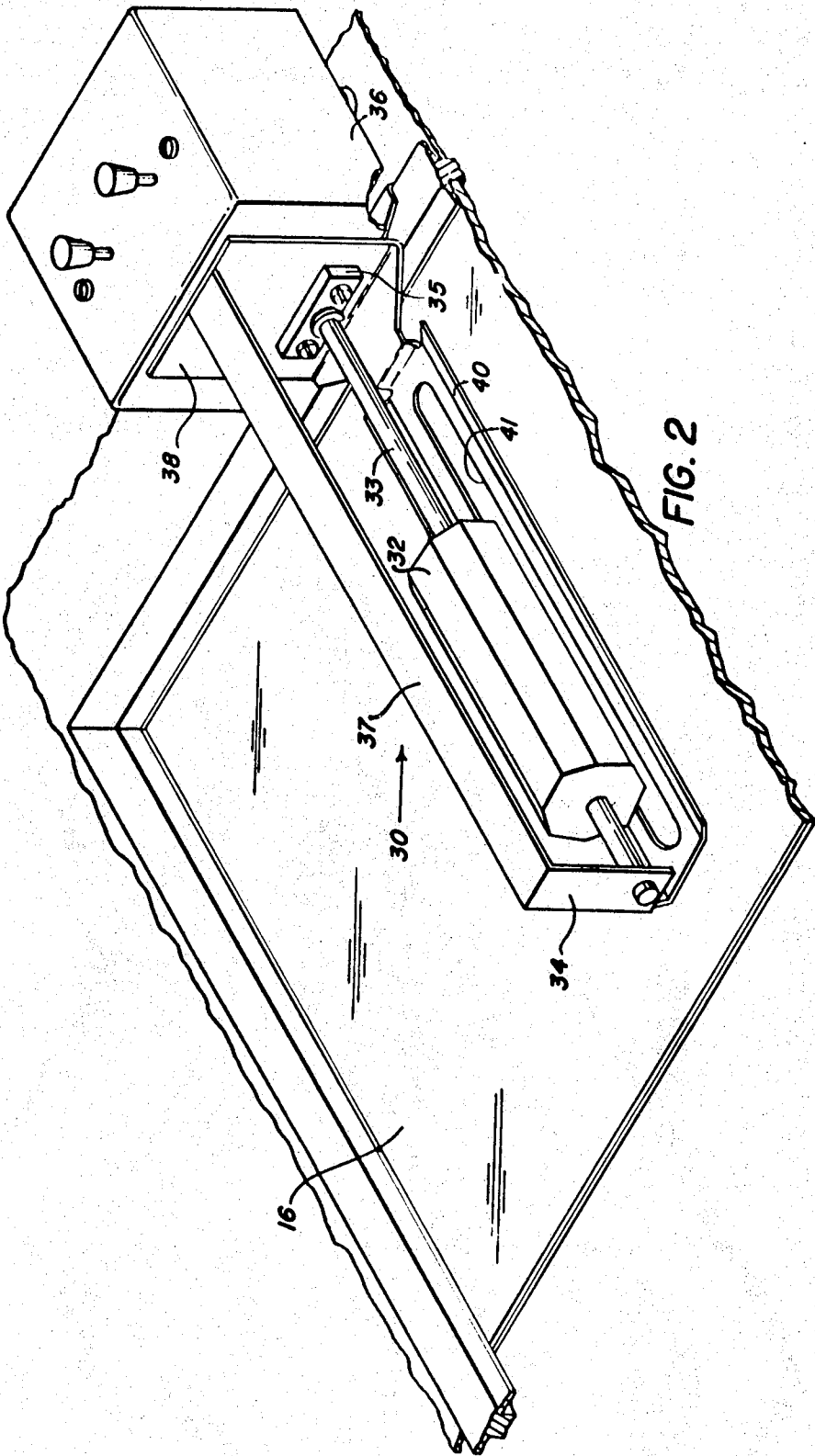
[56] **References Cited**  
**UNITED STATES PATENTS**

2,602,369 7/1952 Tuttle ..... 355/39

**1 Claim, 6 Drawing Figures**







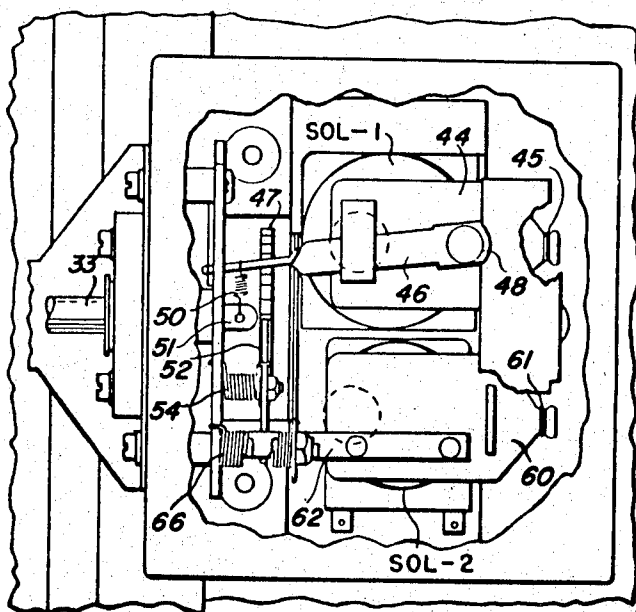


FIG. 3

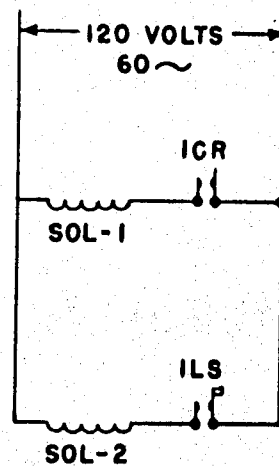


FIG. 6

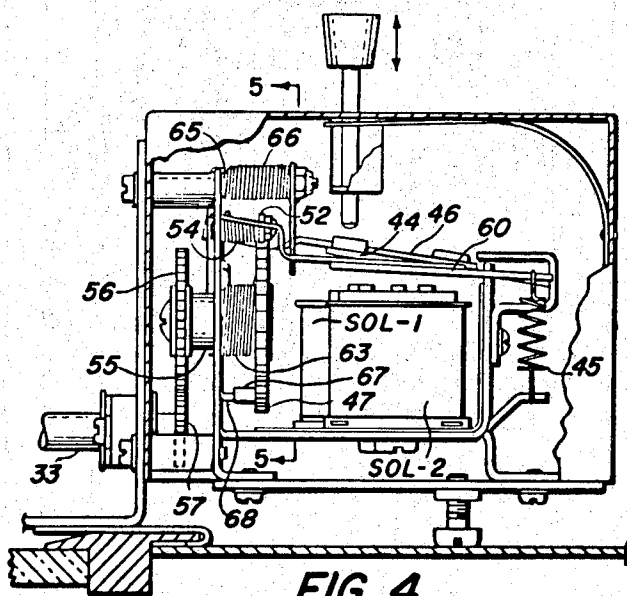


FIG. 4

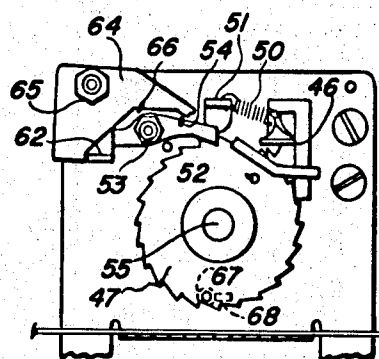


FIG. 5

## FORMS REPRODUCTION APPARATUS

This invention relates to a forms copying imprinter device for use with an electrostatic copying machine and in particular to a device for presenting an additional reproduction input in sequence on the bottom edge, top edge, or through a slit of a document to be reproduced by a conventional electrostatic "office copier."

In Mayo et al. U.S. Pat. No. 3,062,109, issued Nov. 6, 1962, there is shown an electrostatic reproducing machine of the "office copier" type wherein a xerographic plate in the form of a drum comprising a layer of photoconductive insulating material on a conductive backing is given a uniform electric charge over its surface and then exposed to the subject matter to be reproduced usually by conventional projection techniques. This exposure discharges the plate areas in accordance with the radiation intensity as determined by the subject matter to be reproduced that reaches them and thereby creates an electrostatic latent image on or in the plate coating. The latent image which now corresponds to the subject matter is then developed on the plate and transferred to support material, usually paper. For the purposes of this disclosure an "office copier" refers to that type of reproduction machine having a platen capable of accommodating an original to be copied thereon and a scanning means for producing light images of the document.

It is often necessary to make and send many copies of an original document to various addresses and perhaps containing variable information. In some cases, long lists of names or numbers or other variable data in sequence are provided either at the top, at the bottom or in suitable blank space formed in each original.

It may be necessary to add different names, addresses, numbers or other information to reproduced copies at the top, bottom or in a blank space provided which is to be filled in later.

It is therefore an object of this invention to improve reproduction apparatus for reproducing composite copies from a form original and a sequentially applied variable input.

Another object of this invention is to include on every copy, being reproduced, variable information such as the name of the person/or the place that the copy is to be distributed.

A further object of this invention is to imprint individual copies automatically with the names, addresses or other desired information in sequence.

A still further object of this invention is to incorporate in an "office copier" machine capable of simultaneously reproducing from a form original and a source of variable information.

These and other objects of the invention are attained by a device that is attachable to the platen of a "office copier" machine. The device supports a movable element that contains variable information and is indexed to present various portions of the information to the exposure station of the "office copier" for projecting the text and a form original for reproduction.

Various other objects and advantages will appear from the following description of one embodiment of the invention, and the novel features will be particularly pointed out hereinafter appended with the claims.

For a better understanding of the invention as well as further objects and features thereof, reference is had to

the following detailed description of the invention to be read in connection with the accompanying drawings, wherein:

FIG. 1 is a schematic view of a preferred embodiment of the xerographic apparatus used with the present invention;

FIG. 2 is a right hand perspective view of the imprinter apparatus constructed in accordance with the present invention applied in conjunction with the platen of the xerographic apparatus of FIG. 1;

FIG. 3 is a partial top view of the sequential drive system for the imprinter apparatus with parts broken away to show the arrangement of various elements in the drive system;

FIG. 4 is a partial front view of the drive system with parts broken away;

FIG. 5 is a sectional view taken along lines 5—5 of FIG. 4; and

FIG. 6 is a schematic electrical circuit wiring diagram for supplying and controlling electrical power to the drive system.

As shown in FIG. 1, the "office copier" in the form of a xerographic apparatus, comprises a xerographic plate including a photoconductive layer or light receiving surface on a conductive backing and formed in the shape of a drum 10 which is journaled in a frame to rotate in the direction indicated by the arrow to cause the drum surface sequentially to pass a plurality of xerographic processing stations.

For the purpose of the present disclosure, the several xerographic processing stations in the path of movement of the drum surface may be described functionally as follows:

A charging station at which a uniform electrostatic charge is deposited on the photoconductive layer of the xerographic drum is shown at A. An exposure station, at which a light to be reproduced is projected onto the drum surface to dissipate the drum charge on the exposed areas thereof, and thereby form a latent electrostatic image on the copy to be reproduced, is shown at B. A developing station, where a xerographic drum is developed, is shown at C. A transfer station, at which the xerographic powder image is electrostatically transferred from the drum surface to the material, is shown at D. A drum cleaning station is shown at E.

The charging apparatus or corona charging device 12 includes a corona discharge array of one or more discharge electrodes that extend transversely across the drum surface and are energized from a high potential source and are substantially enclosed within a shielding member.

The optical scanning or projection assembly generally designated 14, comprises a platen 16 which may consist of a transparent plate member such as, glass which is adapted to receive an original. The platen is uniformly illuminated and arranged in light projecting relation to the moving light receiving surface of the xerographic drum.

Adjacent to the exposure station is the developing station C in which there is positioned a developer apparatus 18 including a developer housing having a lower or sump portion for accumulating developer material 20. Mounted within the developer housing is a motor driven bucket-type conveyor used to carry the developer material previously supplied to the developer housing to the upper portion of the developer housing

from where the developer material is cascaded over a hopper chute onto the drum.

As the developer material cascades over the drum, toner particles of the developer material adhere electrostatically to the previously formed electrostatic latent image areas on the drum to form a visible xerographic powder image; the remaining developer material falling off the peripheral surface of the drum into the bottom of the developer housing. Toner particles consumed during the developing operation to form the xerographic powder images are replenished by a toner dispenser 22 mounted within the developer housing.

Positioned next adjacent to the developing station is the image transfer station D which includes suitable sheet feeding mechanism adapted to feed sheets of paper successively to the xerographic drum in coordination with the presentation of the developed image on the drum at the transfer station.

The next and final station in the device is the drum cleaning station E whereat any powder remaining on the xerographic drum is flooded with light to cause dissipation of any residual electrical charge remaining of the xerographic drum. Removal of residual powder from the xerographic drum is effected by means of a brush cleaning device 24 adapted to continuously clean the xerographic drum.

It is believed that the foregoing description is sufficient for the purposes of this application to show the general operation of a xerographic reproducing apparatus. For further details concerning the specific construction of the xerographic apparatus shown, reference is made to the above-mentioned U.S. Pat. No. 3,062,109 issued Nov. 6, 1962 to Mayo et al.

An imprinter apparatus generally designated as 30 is mounted on the machine top cover plate above the platen 16 by any suitable means but preferably of a type such as suction cups which will permit easy attachment and removal of the imprinter. The apparatus 30 comprises a rotatable member 32 the purpose of which will be described hereinafter. The member 32 is provided with a shaft 33 extending out of both ends of the member and is journaled at one end to a vertically depending element 34 and at its other end in a bracket 35 secured to an actuator housing 36. The element 34 forms part of a frame structure 37 which supports the member 32 in cantilever fashion over the platen 16. A support plate 38 secured to the frame 37 serves to attach the frame to the housing 36 by means of the bracket 35.

The purpose of the rotatable member 32 is to support thereon the text such as, addresses, numbers, etc., to be presented to the platen 16. As previously stated, the member 32 is mounted on the shaft 33 by any suitable means and is slidable along the shaft from left to right as shown in FIG. 2. The purpose of this movement is to enable the text contained on the member to be positioned as desired relative to a form original. Suitable means is provided for preventing rotation of the member 32 relative to the shaft 33 in order to permit a rotational drive capability therebetween.

Mounted below the member 32 and the shaft 33 is an elongated plate 40 having a slot 41 formed therealong in parallel with the shaft 33. The plate 40 is suitably mounted on the housing 36 to be movable therewith when the imprinter apparatus is not in use and is arranged in parallel with and spaced slightly therefrom the top surface of the platen 16. It is noted that in the

embodiment shown that the rotatable member 32 is eight sided and that each side may be rotated so that the matter imprinted will be copied properly through the slot 41.

The slot 41 is just wide enough to expose the amount of subject matter desired to be copied. In the format of the member 32 shown in FIG. 2 there are eight faces for portions of information to be copied on eight different copies. The slot 41 will therefore only expose that amount on subject matter on each of the sides of the member 32 when that side is aligned with the slot 41. The rotatable member 30 is indexed in order to present each side of the member 32 sequentially relative to the slot 41 by a drive mechanism to be described below.

The drive mechanism for imparting rotation to the member 32 may be any suitable automatic step-counter such as the type disclosed in the above-indicated patent to Mayo et al. which may be manually actuated for a predetermined set position and be actuated toward the starting position in step-by-step fashion upon each impulse. The counter is housed in the housing 36 schematically shown in FIG. 6 whereupon solenoid SOL-1 is energized to operate an actuator arm or flapper 44 (see FIG. 3).

The actuator arm 44 is held normally in the inoperative position shown in FIG. 4 by a spring 45. When the actuator is operated by the solenoid SOL-1 an extension arm 46 mounted on the actuator 44 moves there with to engage a ratchet wheel 47 thereby indexing the drive mechanism in the manner described below. The extension arm 46 is pivoted on the actuator 44 about pivot point 48 and is held in the position shown in FIG. 3 by means of a spring 50 which is mounted on the bracket 51. As the extension arm 46 is operated, the arm moves downward by engaging the ratchet wheel 47 and moves along with the ratchet upon rotation thereof until the actuator 44 engages the solenoid and the pawl 52 engages a tooth on the ratchet wheel. When the solenoid SOL-1 is released the actuator arm is moved back into the position shown in FIGS. 3 and 4 by means of the springs 50 and 45 ready to again index the drive mechanism. The pawl 52 is pivotally mounted on the bracket 51 by means of a shaft 53 which has a coil spring 54 mounted thereon for the purpose of biasing the pawl 53 with the teeth of the ratchet wheel 47.

The ratchet wheel 47 is connected by means of a shaft 55 to a gear 56 which engages a gear 57 connected to the shaft 33 of the imprinter. Thus, the drive mechanism for rotating the member 32 may be indexed a specific number of times, according to how many times the scanner mechanism in the xerographic machine operates thus actuating the solenoid SOL-1. Each time the drive mechanism is indexed, the rotatable member 30 is rotated on an incremental step in order to present a succeeding face or side to the slot 41 and which will be imaged by the xerographic machine along with the form original.

After a particular form original and the side of the member 30 has been scanned by the scanning mechanism of the machine, a mechanical limit switch in the machine ILS is closed thus energizing a solenoid SOL-2 which serves to reset the drive mechanism in a manner to be described below. A resetting actuator arm 60 is normally held in the unoperative position as shown in FIG. 4 and during indexing action by solenoid SOL-1 by a spring 61 which is similar to spring 45 which holds the actuator 44 in the inoperative position.

As the resetting actuator 60 is operated, the outer extension 62 thereof will contact the pawl 52 and pivot it about shaft 53 thereby releasing the ratchet wheel 47. The ratchet wheel will be returned to its starting position by means of coil spring 63 which will serve to rotate the ratchet wheel in the counterclockwise direction as shown in FIG. 5. As the outer portion 62 of the resetting actuator contacts the pawl 52 a dog 64 pivoted about a shaft 65 is moved in a counterclockwise direction as shown in FIG. 5 by means of a spring 66. The dog 64 serves to maintain the pawl 52 out of contact with the ratchet wheel before the ratchet wheel can return completely and, comes to rest when a protruding portion 67 on the ratchet wheel contacts a stopping means 68. When the actuator 44 is again operated, the actuator arm 46 will contact the outer portion of the dog 64 thereby releasing the pawl 52 and the resetting actuator arm 60 to the position shown in FIG. 5.

While the invention has been described with reference to the structure disclosed herein, it is not confined to the details set forth, but is intended to cover such modifications or changes as may come within the scope

of the following claims.

What is claimed is:

1. A mechanism to present variable copyable information for cooperation with the platen of a copying machine having optical means for projecting the image of the information and the image of a document to be copied therewith upon an image receiving surface of the copying machine including

a frame arranged for positioning adjacent the platen, a movable member arranged to be driven in said frame and supporting text information thereon to be presented to the platen and,

drive means operatively associated with the movable member for moving the same from a first position to additional positions to present different portions of the member to the platen for optical projection along with the document by the copying machine, said drive means being operatively connected to the copying machine for producing indexing action of said movable member upon each copy production cycle of the machine.

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