March 20, 1956 H. P. HINTZ ET AL 2,738,704

STRIP MATERIAL ADVANCING MECHANISM

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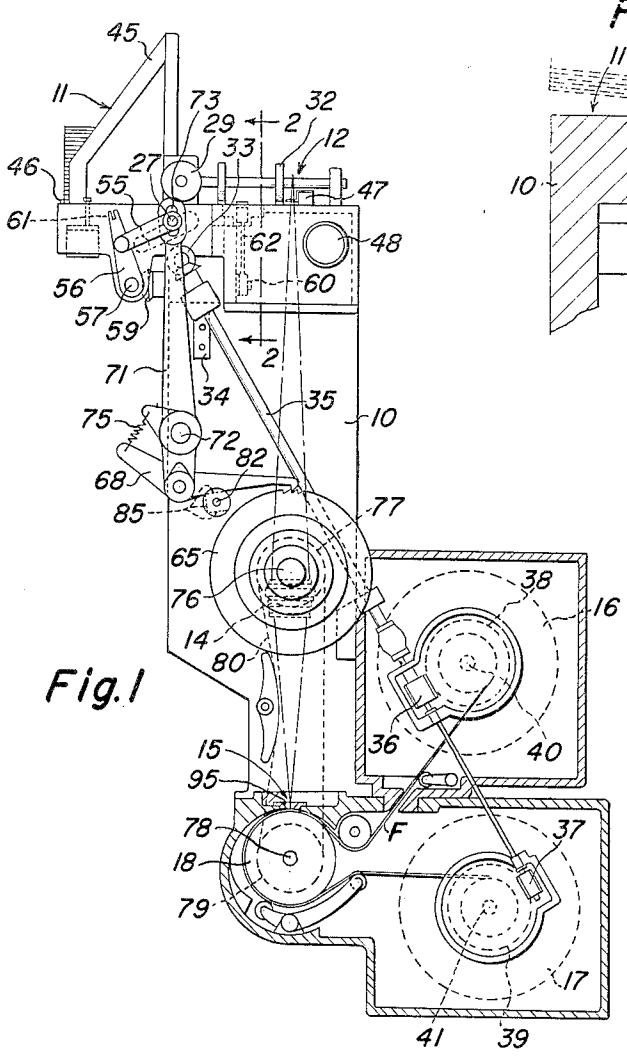


Fig. 1

Fig. 7

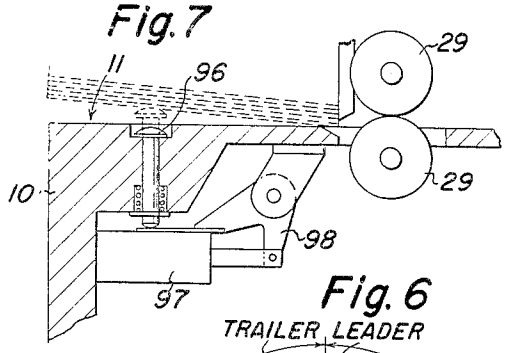


Fig. 6

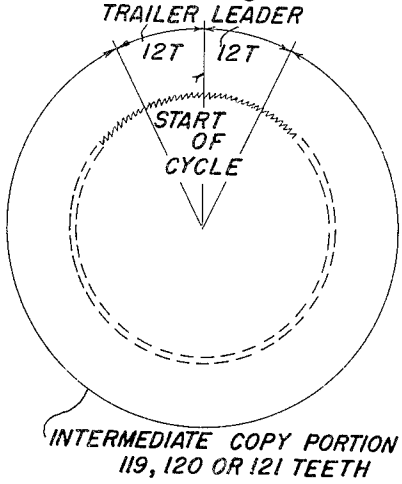


Fig. 8

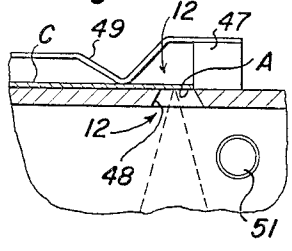
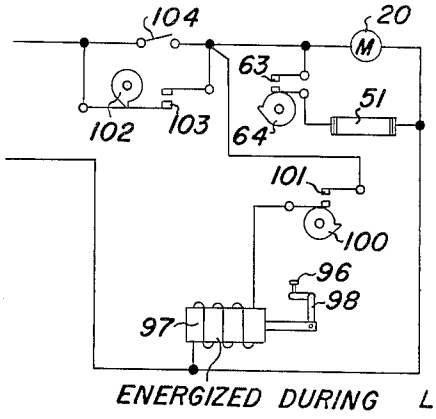
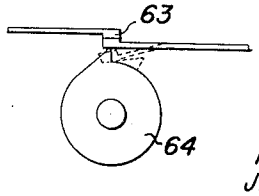


Fig. 12



ENERGIZED DURING L & T INTERVALS

Fig. 9



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Fig. 10

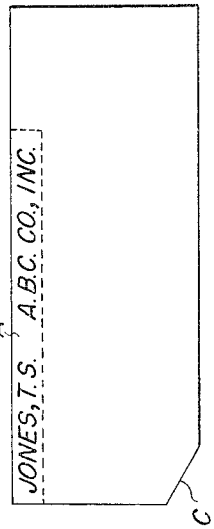
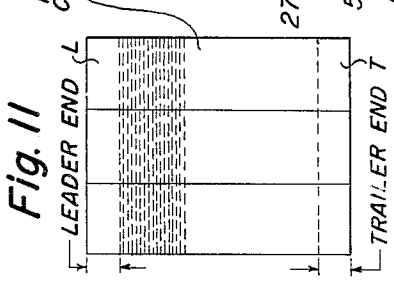


Fig. 2

Fig. 11



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Fig. 3

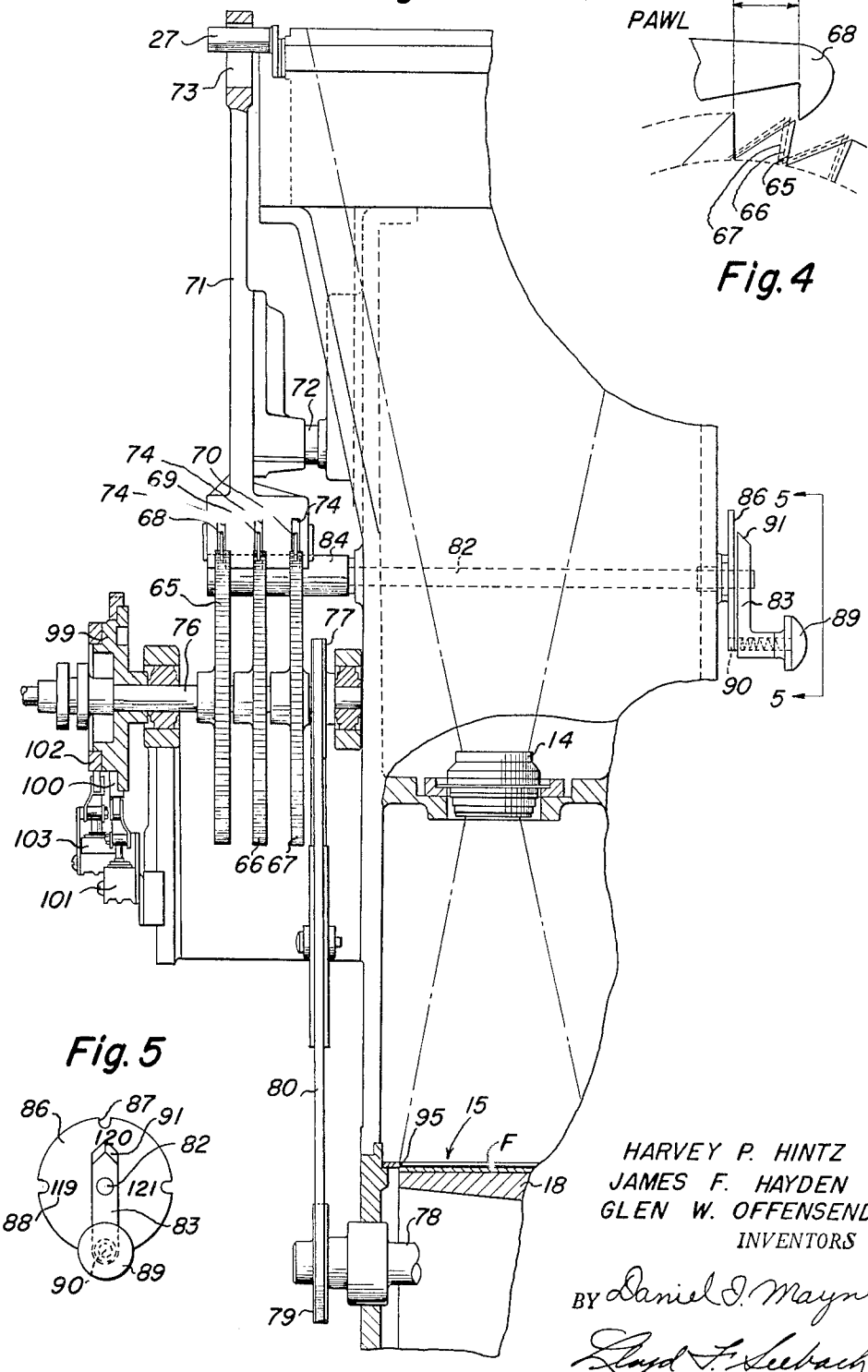


Fig. 4

Fig. 5

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2,738,704

STRIP MATERIAL ADVANCING MECHANISM

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Application December 19, 1952, Serial No. 326,938

7 Claims. (Cl. 88—24)

This invention relates to photography and more particularly to apparatus for photographically copying the predetermined areas of a preselected number of documents or cards in which an advancing mechanism moves equivalent lengths of light-sensitive material intermittently in a number of increments corresponding to the preselected number of cards.

In the printing trade it is customary in the preparation of various directories to set up each page and then to maintain standing type for each entry. Although in many instances changes must be made with each printing, these changes in the form of additions or deletions from the page are accomplished by regrouping and composing the type for each page and are also necessitated by any single change in any one column or page. This practice is time consuming, very costly and requires the stocking of an unusual amount of type.

The present invention provides a structure wherein the number of lines to be arranged within a column of fixed or predetermined length may be varied. In the system utilizing the invention the printing establishment maintains a card file, which can be easily revised and maintained current, the cards being arranged in some designated order and photographed as the first step in the preparation of the printing plates. Accordingly, the accurately typed cards containing the line or lines of information to be printed are maintained in place of the standing type and any additions to or deletions from the directory can easily be made by inserting or extracting cards from the file. Printing a revised issue of a directory involves grouping a preselected number of cards for each column and photographing only that area containing the information which is to appear in the directory. The resulting negatives are then utilized to make an offset printing plate by direct contact process, as is well known in the printing art.

In the photocomposing apparatus utilizing the present invention, the data, name, address, etc. that is to be copied is typed on each card within the same predetermined area so that as each card is fed successively into the photographing station the predetermined area is properly aligned with the aperture in said station. Since the predetermined area may contain one or more lines of data and the length of the directory page is laid out for a preselected number of such areas, it is evident that the number of areas on the cards for various reasons may not always agree with the number of areas available. For example, assume that each directory page normally will contain 120 areas of data. If the cards are arranged in a designated order, it may be found that it is desirable to have only 119 cards in a group in order that the next group of cards may start or constitute another column in which case it would not be desirable to add another card to make up the necessary 120 areas. On the other hand, if it is found that 121 cards will complete a column, it may be desirable to include all the cards in the column rather than use the last card to start the next column.

The present invention provides a film advancing means

which permits selection of the proper number of increments of film advance so that the number of exposures made are in accordance with the preselected number of cards, thereby permitting a variable number of exposures to be made in equivalent lengths of the film strip. This is accomplished by driving the film drive roll through one of three ratchets. In the mechanism to be described each of the ratchets has the same number and size of teeth arranged over a portion of the periphery thereof to provide a leader and trailer portion on the film strip of equal length, the remainder of the peripheries of each ratchet being divided into a different number of equal teeth so that equivalent lengths of the film strip can be advanced in different increments. With this arrangement, the proper ratchet is chosen by a selecting device whereby the ratchet has the same number of teeth as there are cards in the group to be photographed. Since the diameters of the ratchets are the same, each overall length of the film strip is of the same size and has equal leader and trailer portions on each end thereof.

The primary object of the invention is, therefore, to provide a photocopying apparatus of the type described in which a film advancing mechanism is utilized to advance equivalent lengths of a film strip selectively in a different number of increments.

Another object of the invention is to provide a photocopying apparatus of the type described in which a multiple ratchet drive advances equivalent lengths of a film strip including a leader end and a trailer end and an intermediate copy portion, the copy portion of each film strip being of equal length and selectively advanced in different increments.

Yet another object of the invention is to provide a photocopying apparatus of the type described in which a film advancing mechanism moves equivalent lengths of a film strip past an exposure station selectively in different increments and is operatively connected to the card feeding means to render said feeding means inoperative upon movement of the predetermined length of film strip past the exposure station.

And still a further object of the invention is to provide in a photocopying apparatus of the type described a film advancing means including three ratchets which are selectively rendered operative to advance equivalent lengths of a film strip past an exposure station in increments corresponding to the number of documents or cards to be photographed and means movable with the ratchets for rendering the card feeding means inoperative with respect to the stack of cards as the last card is fed into the photographing station and for rendering the card feeding drive mechanism inoperative after the last card has been moved out of the photographing station and a trailer end has been moved past the exposure station.

These and other objects and advantages will be apparent to those skilled in the art by the description which follows.

Reference is now made to the accompanying drawings wherein like reference numerals designate like parts and wherein:

Fig. 1 is a side elevation of a photocopying apparatus embodying the invention;

Fig. 2 is a vertical section taken substantially on line 2—2 of Fig. 1 and showing the feeding mechanism for moving the document or card out of the photographing station;

Fig. 3 is a partial vertical section and front elevation showing particularly the elements comprising the film advancing mechanism and the manner in which such elements are interconnected;

Fig. 4 is an enlarged detail view showing the relation of the ratchet teeth on the different ratchets with respect to the pawls;

Fig. 5 is a side view, as indicated by line 5—5 in Fig. 3, of the selector knob;

Fig. 6 is an enlarged detail view of the ratchet showing the arrangement of the teeth thereon;

Fig. 7 is a detail sectional view showing the means for raising the stack of cards to render the card feeding means ineffective;

Fig. 8 is a detail view showing the relation of the illuminating means and the aperture in the photographing station;

Fig. 9 is a detail view of the cam-actuated contact members for energizing the illuminating lamp;

Fig. 10 is a plan view of a card showing the location of a predetermined area to be copied;

Fig. 11 is a plan view of several film strips arranged to provide a multiple column page and showing the division of such strips; and

Fig. 12 is a simplified wiring diagram.

A preferred embodiment of the invention is disclosed in conjunction with apparatus which feeds successively the cards from the bottom of a stack positioned in a feeding station into a photographing station in which a predetermined area on the card is aligned with an aperture. Although the apparatus utilizes cards that are available commercially, such as IBM cards, it is understood that various other types of cards, or discrete sheets may be used and the term "document" as used herein is meant to designate any single sheet having a predetermined area to be copied.

The copying apparatus comprises a frame **10** on which is mounted a document feeding means **11** for moving the document into photographing station **12** which is spaced from the feeding station and then into receptacle **13**. A projection lens **14** is mounted on frame **10** between photographing station **12** and exposure station **15** and images the area of each document in said exposure station. The film strip F is moved through exposure station **15** from supply reel **16** to take-up reel **17** by film drive roll **18**, as shown in Fig. 1.

Motor **20** by means of chain **21** drives shaft **22** and through gears **23** and **24** drives shaft **25** which has a collar **26** fixed to one end thereof and an eccentrically arranged stud **27** fixed to said collar. Through gears **24** and **28** feed rolls **29** are rotated to move the document into photographing station **12** and by means of bevel gear **30** and a similar gear, not shown, on shaft **31** the feed rolls **32** are rotated to move the document from photographing station **12** into receptacle **13**. Bevel gear **33** on shaft **22** drives bevel gear **34** to rotate shaft **35** on which are secured worm gears **36** and **37** which through worm wheels **38** and **39** and tendency drives, not shown, rotate supply spindle **40** and take-up spindle **41**, respectively, in a manner well known in the art.

The cards C are arranged in a designated order and counted for the number of areas to be photographed. The stacked cards are then placed in hopper **45** with the area A to be photographed facing downward, the bottom card of the stack being moved toward photographing station **12** by reciprocating pickers **46** and into the bite of feed rolls **29** which move the card into station **12** against an edge of locating bar **47** arranged adjacent aperture **48**. The card is moved under and held in position by spring **49** while in the photographing station and area A is then aligned with aperture **48**. Although the area A which is to be photographed is in the present instance adjacent both edges of a card, the bar **47** and aperture **48** could be so positioned with respect to each other so that any area of card C could be photographed. Pickers **50** then engage the end of the card and moves it in a direction perpendicular to its former movement and into the bite of rolls **32** which move the card into receptacle **13**. A tubular type mercury vapor lamp **51** is arranged parallel to and beneath aperture **48** to illuminate the area to be photographed and is energized in timed relation to the movement of a card into and out of photographing station **12**. This type of lamp is used to give very brief but intense illumination of aperture **48**.

Stud **27** is connected by link **55** to arm **56** which is secured to shaft **57** on which miter gear **58** is secured, see Fig. 2. As shaft **25** is rotated, arm **56** is oscillated by link **55** and the oscillations of shaft **57** are transmitted by miter gears **58** and **59** to shaft **60**. Pickers **46** and **50** are reciprocated by arms **61** and **62** which are secured to shafts **57** and **60**, respectively, and since they are interconnected, said pickers operate in synchronism with each other.

The mercury vapor lamp **51** is connected across the lines as shown in Fig. 12 and is intermittently energized by the closing of contacts **63** which are actuated to a closed position by cam **64** which is carried by shaft **22**. Inasmuch as cam **64** is movable with the feeding means, the high point or actuating position of the cam is arranged on shaft **22** so that contacts **63** will be closed at the instant picker **50** engages the card to move it from the photographing station into the bite of rolls **32**.

The film advancing means comprises film drive roll **18**, ratchets **65**, **66** and **67**, pawls **68**, **69** and **70** and the oscillatable arm **71**. Arm **71** is pivotally mounted at **72** to frame **10**, the longer portion thereof being provided with an elongated aperture **73** for engaging eccentric stud **27** and the lower portion being provided with spaced slots **74** in which pawls **68**, **69** and **70** are pivotally mounted. The pawls are biased toward the ratchets by springs **75**. Ratchets **65**, **66** and **67** are keyed or otherwise secured to shaft **76** as well as sprocket **77** which drives the film drive roll shaft **78** through sprocket **79** fixed to shaft **78** and chain **80** encircling said sprockets. As stud **27** is moved in a circular path by shaft **25**, arm **71** is oscillated and carries with it the pawls **68**, **69** and **70** which are moved over their respective ratchets when the lower end of arm **71** is moved to the right in Fig. 1 and engage the ratchets to rotate shaft **76** and sprocket **77** and, hence, sprocket **79**, shaft **78** and film drive roll **18** when the lower end of arm **71** is moved to the left. The film advancing mechanism is, therefore, operatively connected to the document feeding means and is moved in synchronism therewith, since the eccentric arrangement of stud **27** also oscillates pickers **46** and **50**.

As described hereinbefore, the film advancing mechanism moves equivalent lengths of the film strip but it may be that the number of exposures to be made in the same lengths of the film strip may differ. For this reason a plurality of ratchets are arranged on shaft **76** and only one of said ratchets will be operable at any one time. Each of ratchets **65**, **66** and **67** are of the same diameter so that the peripheries are of the same length and for each revolution thereof, the film drive roller **18** is always rotated through the same angle to advance equivalent lengths of the film strip. In Fig. 6 a ratchet is shown on which a number of teeth are provided to advance a length of film strip which will include a leader end L, an intermediate copy portion CP for 120 exposures by way of an example, and a trailer end T, the leader and trailer ends being provided to permit handling of the negative. Such a group of ratchets, for example, may be provided with 12 teeth for the leader end L and an adjacent 12 teeth for the trailer end T, the ratchets being secured to shaft **76** so that the last tooth of the trailer end is aligned with the driving face of the pawls when said pawls are in their extreme position to the left. The intermediate portions of the ratchets are then divided into 119, 120 and 121 teeth. Since the 120 teeth correspond to the number of normal exposures, the teeth on this one sprocket can all be of the same size or a total of 144 equal teeth. However, with respect to the other sprockets, 119 teeth and 121 teeth must cover the same angular portion of the periphery as the 120 teeth, the 24 teeth being of the same size and arranged in the same angular relation to the periphery as in the 120 teeth ratchet. Consequently, 119 teeth will advance larger increments

of the film strip for each exposure than the other two and 121 teeth will advance smaller increments. In this way the leader and trailer ends as well as the intermediate copy portions are always of the same length so that the overall lengths of the film strips are always equal for each preselected number of cards. Since the full movement of each pawl is the same, the movement is made sufficiently large so that the pawl will pick up the tooth giving the largest increment of movement (119), as shown in an exaggerated form in Fig. 4. The differences in the pitch of the various size teeth represents an amount of lost motion in movement of the pawl.

In order to select the ratchet which will advance the film strip in increments corresponding to the number of exposures to be made, a shaft **82** extends through frame **10** and has a selector arm **83** secured to one end thereof and a cylindrical cam member **84** secured to the other end. The cam member is arranged beneath the pawls **68**, **69** and **70** and is provided with slots **85**, see Fig. 1, arranged in quadrature about the periphery thereof and with respect to each pawl. The slots permit its respective pawl to be moved by spring **75** into engagement with its respective ratchet while the other two pawls are prevented from engaging their ratchet but are permitted to be moved thereover as arm **71** is oscillated. Plate **86** is secured to frame **10** beneath selector arm **83** and is provided with notches **87** and numerals **88** designating the ratchet teeth, or number of exposures. Selector arm **83** has a spring biased knob **89** for removing pin **90** from notches **87**. When the cards have been arranged in a designated order and the number of exposures to be made has been determined, knob **89** is pulled outward to withdraw pin **90** from the notch and arm **83** is rotated till end **91** is opposite the number corresponding to the number of exposures to be made. As arm **83** is rotated, cam **84** is rotated therewith and one of slots **85** will permit the proper pawl to engage its respective ratchet.

Since the negatives are utilized to make an offset printing plate by direct contact process, the negatives may be grouped, as shown in Fig. 11, to form a multiple column page. It is necessary, therefore, that the intermediate copy portion of each negative be completely exposed, that is, the separate exposures cannot be separated by an unexposed portion. As a result, aperture **95** in exposure station **15** is made slightly larger than the projected image of aperture **48** so that the exposure areas on the film strip actually overlap.

In the event several groups of cards are placed in hopper **45** and such groups may require different numbers of exposures, it is necessary to stop the feeding of cards during the interval that the trailer end of the film strip is being advanced and also to stop the feeding action and, hence, the movement of the film strip after each length of film strip has been advanced. In order to render the card feeding means ineffective during the movement of the leader and trailer ends, two spaced pins **96** are positioned in feeding station **11** so as to engage the rear portion of the stack of cards and are actuated into position for raising the stack about its forward edge sufficiently far above pickers **46** so that no cards will be fed toward feed rolls **29**. This is accomplished by a pair of solenoids **97** and a pair of bell crank levers **98** associated with said pins. One end of levers **98** engage the bottom of pins **96** and the other ends are pivotally connected to the armatures of solenoids **97**, as shown in Fig. 7. A sleeve **99** secured to shaft **76** carries a cam **100** which actuates normally-open switch **101** to a closed position and a second cam **102** which actuates normally-closed switch **103** to an open position. With reference to Fig. 12, it will be observed that switch **101** is in circuit with solenoid **97** and switch **103** is in parallel with start switch **104**. Cam **100** is designed so that it will hold switch **100** in a closed position to maintain solenoids **97** energized and pins **96** in the raised position to hold the stack above picker **46** to maintain the document feeding means ineffective during the intervals that the leader end and trailer end of the film strip is being advanced. Cam **102** is designed to open switch **103** upon completion of the advancement of the trailer end to cut out motor **20** and thus render the feeding means inoperative. The operator, therefore, must merely select and set arm **83** on the proper numeral to insure the correct increment of film advance and then hold switch **104** in its closed position momentarily to insure closure of switch **103** and when the leader end has been advanced, switch **100** will be permitted to open by cam **101** thereby retracting pins **96** and the cards will then be fed from the stack in synchronism with the movement of the film strip. In timed relation to the feeding of the last card of a group from the stack, cam **100** will close switch **101** to render the feeding means ineffective by raising the stack by means of pins **96**. The film strip will continue to be advanced to provide the trailer end at the end of which motor **20** will be cut out by the opening of switch **103** by cam **102**. Since both the cams and ratchets are secured to the same shaft and are properly aligned, the points at which the switches are actuated are exactly the same for any preselected number of exposures. To insure immediate stoppage of motor **20** and, hence, advancement of the film strip, an electromagnetic clutch and brake may be inserted between the motor shaft and the pulley driven thereby.

From the foregoing description it is evident that a film advancing mechanism is provided which permits a variable number of exposures to be made on equivalent lengths of a film strip and which can be easily accomplished by normally skilled operators. While the film advancing mechanism has been described with relation to advancing a film strip having a leader and trailer end, such handling portions may be eliminated. In such a case the diameters of the ratchets would still be the same and the peripheries of the ratchets would merely be divided into different numbers of teeth. Further, such a group of ratchets need not necessarily be limited to three ratchets but may comprise as many more as the movement of the pawls will permit which will also depend on the size of the ratchet teeth. By providing two sets of ratchets and pawls, the ratchets being connected to the same film drive roll, different length film strips may be obtained by utilizing the same oscillatable arm. Since many other modifications and applications of the invention will be suggested and apparent to those skilled in the art, the scope of the invention is pointed out in the appended claims.

Having now particularly described our invention, what we desire to secure by Letters Patent of the United States and what we claim is:

1. In apparatus for photographically copying on equivalent lengths of a film strip the predetermined area of a preselected number of documents comprising a photographing station provided with an aperture arranged in accordance with the location of said area on said documents when said documents are positioned in said photographing station, an exposure station provided with an aperture larger than the projected image of said predetermined area, means for successively feeding said documents into and out of said photographing station, a film drive roll adapted to move said film strip through said exposure station, film advancing means including a plurality of driven members operatively connected to said film drive roll and a plurality of drive members operatively connected to said feeding means for actuating said driven members to rotate said film drive roll in synchronism with the movement of said documents, each of said driven members being adapted to be actuated by its respective drive member intermittently for moving equivalent lengths of said film strip in a different number of increments, and means operatively connected to said drive members for selecting and rendering operative only the drive member and driven member advancing said film

strip in a number of increments corresponding to said preselected number of documents to be copied.

2. In apparatus for photographically copying on equivalent lengths of a film strip the predetermined area of a preselected number of documents comprising a photographing station provided with an aperture arranged in accordance with the location of said area on said documents when said documents are positioned in said photographing station, an exposure station provided with an aperture larger than the projected image of said predetermined area, means for successively feeding said documents into and out of said photographing station, a film drive roll adapted to move said film strip through said exposure station, film advancing means including a plurality of ratchets secured to a common shaft operatively connected to said film drive roll, an oscillatable member operatively connected at one end thereof to said feeding means, and a plurality of pawls pivotally mounted on the other end of said oscillatable member and adapted to actuate said ratchets to intermittently rotate said film drive roll for moving said film strip in synchronism with the movement of said documents, said ratchets for each revolution thereof advancing equivalent lengths of said film strip and being provided with teeth of the same size over the same portion of the periphery thereof and with teeth of different size on each of said ratchets for the remainder of the periphery for moving equivalent lengths of said film strip in a number of different increments, and cam means arranged with respect to said pawls for selecting and rendering operative only the pawl and ratchet for advancing said film strip in a number of increments corresponding to said preselected number of documents to be copied.

3. In apparatus for photographically copying on equivalent lengths of a film strip the predetermined area of a preselected number of documents comprising a photographing station provided with an aperture arranged in accordance with the location of said area on said documents when said documents are positioned in said photographing station, an exposure station provided with an aperture larger than the projected image of said predetermined area in said exposure station, means for successively feeding said documents into and out of said photographing station, a film drive roll adapted to move said film strip through said exposure station, film advancing means including three ratchets secured to a common shaft operatively connected to said film drive roll, an oscillatable member operatively connected at one end thereof to said feeding means, and three pawls pivotally mounted on the other end of said oscillatable member and adapted to actuate said ratchets to intermittently rotate said film drive roll for moving said film strip in synchronism with the movement of said documents, said ratchets for each revolution thereof advancing equivalent lengths of said film strip and having teeth of the same size over the same portion of the periphery thereof to provide a leader end and trailer end for said film strip and $(n-1)$, n and $(n+1)$ teeth equally arranged about the remainder of the periphery of each of said ratchets, respectively, to provide an intermediate copy portion between said ends and for moving equivalent lengths of said film strip in different increments, and cam means arranged with respect to said pawls for selecting and rendering operative only the pawl and ratchet for advancing said film strip in a number of increments corresponding to said preselected number of documents to be copied.

4. In apparatus for photographically copying on equivalent lengths of a film strip the predetermined area of a preselected number of documents comprising a feeding station for receiving documents in stacked arrangement, a photographing station spaced from said feeding station and provided with an aperture arranged in accordance with the location of said area on said documents when positioned in said photographing station, an exposure station provided with an aperture larger than the projected image of said predetermined area to permit overlapping exposures, optical means for imaging said predetermined area in said exposure station, means for successively feeding said documents into and out of said photographing station, means arranged in said feeding station and adapted to engage the stacked documents for raising said documents to a position in which said feeding means is rendered ineffective, film advancing means operatively connected to said feeding means and including a plurality of members selectively adapted to move said film strip through said exposure station in synchronism with the movement of said documents, each of said members being adapted to move intermittently equivalent lengths of said film strip in a different number of increments, means operatively connected to said film advancing means for selecting and rendering operative only said member advancing said film strip in a number of increments corresponding to said preselected number of documents to be copied, and means movable with said members and operatively connected to said stack engaging means for actuating said stack engaging means in timed relation to the movement of the last of said preselected number of documents from said feeding station.

5. In apparatus for photographically copying on equivalent lengths of a film strip the predetermined area of a preselected number of documents comprising a feeding station for receiving documents in stacked arrangement, a photographing station spaced from said feeding station and provided with an aperture arranged in accordance with the location of said area on said documents when positioned in said photographing station, an exposure station provided with an aperture larger than the projected image of said predetermined area to permit overlapping exposures, optical means for imaging said predetermined area in said exposure station, means for successively feeding said documents into and out of said photographing station, means arranged in said feeding station and adapted to engage the stacked documents for raising said documents to a position in which said feeding means is rendered ineffective, film advancing means operatively connected to said feeding means and including a plurality of members selectively adapted to move said film strip through said exposure station in synchronism with the movement of said documents, each of said members being adapted to move intermittently equivalent lengths of said film strip in a different number of increments, means operatively connected to said film advancing means for selecting and rendering operative only said member advancing said film strip in a number of increments corresponding to said preselected number of documents to be copied, means movable with said members and operatively connected to said stack engaging means for actuating said stack engaging means in timed relation to the movement of the last of said preselected number of documents from said feeding station, and a second means movable with said members and operatively connected to said feeding means for rendering said feeding means inoperative upon movement of the last of said preselected number of documents from said photographing station.

6. In apparatus for photographically copying on equivalent lengths of a film strip the predetermined area of a preselected number of documents comprising a feeding station for receiving documents in stacked arrangement, a photographing station spaced from said feeding station and provided with an aperture arranged in accordance with the location of said area on said documents when positioned in said photographing station, an exposure station provided with an aperture larger than the projected image of said predetermined area to permit overlapping exposures, optical means for imaging said predetermined area in said exposure station, means for successively feeding said documents into and out of said photographing station, means arranged in said feeding station and adapted to engage the stacked documents for raising said

documents to a position in which said feeding means is rendered ineffective, film advancing means operatively connected to said feeding means and including a plurality of members selectively adapted to move said film strip through said exposure station in synchronism with the movement of said documents, one of said members being adapted to move intermittently a predetermined length of said film strip in equal increments to provide a leader end, a trailer end, and an intermediate copy portion and said other members being adapted to move a length of said film strip equivalent to said predetermined length in said equal increments to provide said leader and trailer ends and in different numbers of equal increments to provide an equivalent intermediate copy portion, means operatively connected to said film advancing means for selecting and rendering operative only said member providing an intermediate copy portion in the number of increments corresponding to said preselected number of documents to be copied, and means movable with said members having a portion thereof operatively connected to said stack-engaging means for actuating said stack engaging means in timed relation to the movement of the last of said preselected number of documents from said feeding station and a second portion thereof operatively connected to said feeding means for rendering said feeding means inoperative upon completion of the advancement of the trailer end of said film strip.

7. In apparatus for photographically copying on equivalent lengths of a film strip the predetermined area of a preselected number of documents comprising a feeding station for receiving documents in stacked arrangement, a photographing station spaced from said feeding station and provided with an aperture arranged in accordance with the location of said area on said document when positioned in said photographing station, an exposure station provided with an aperture larger than the projected image of said predetermined area to permit overlapping exposures, optical means for imaging said predetermined area in said exposure station, illuminating means arranged with respect to said aperture in said photographing station for illuminating said area, means for successively feeding said documents into and out of said photographing station and including cam-operated switch means for actuating said illuminating means during the interval the document is positioned in said photographing station, means including a pair of spaced members arranged in said feeding station and solenoids operatively connected to said members for moving said members into engagement with the stacked documents to raise said documents into a position in which said feeding means is rendered ineffective, film advancing means operatively connected to said feeding means and including a plurality of members adapted to selectively move said film strip through said exposure station in synchronism with the movement of said documents, each of said members being adapted to move intermittently equivalent lengths of said film strip in a different number of increments, means operatively connected to said film advancing means for selecting and rendering operative only said member advancing said film strip in a number of increments corresponding to said preselected number of documents to be copied, and means including a first and a second cam movable as a unit with said members and switch means in circuit with said solenoids and said feeding means, said first cam actuating its respective switch means to energize said solenoids in timed relation to the movement of the last of said preselected number of documents from said feeding station and said second cam actuating its respective switch means to render said feeding means inoperative upon movement of the last of said preselected number of documents from said photographing station.

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