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APPARATUS FOR SELECTIVELY FEEDING AND SEVERING WEBS FROM A PLURALITY OF SOURCES

Filed Nov. 10, 1966

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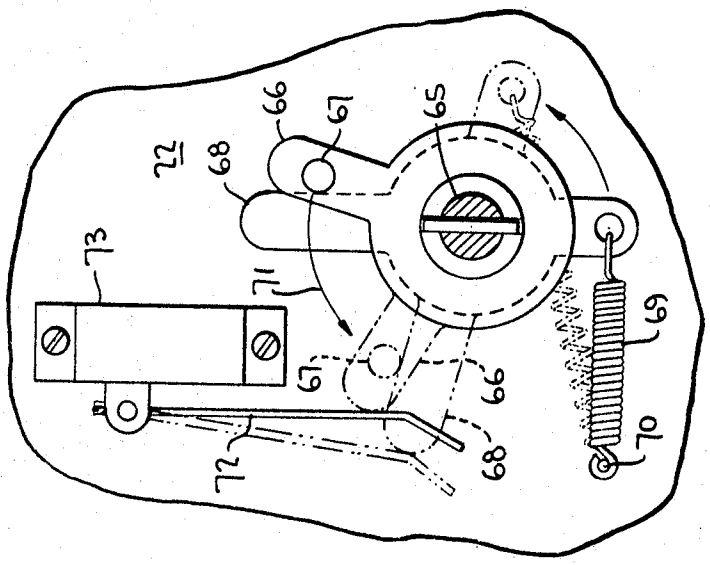
FIG. 7



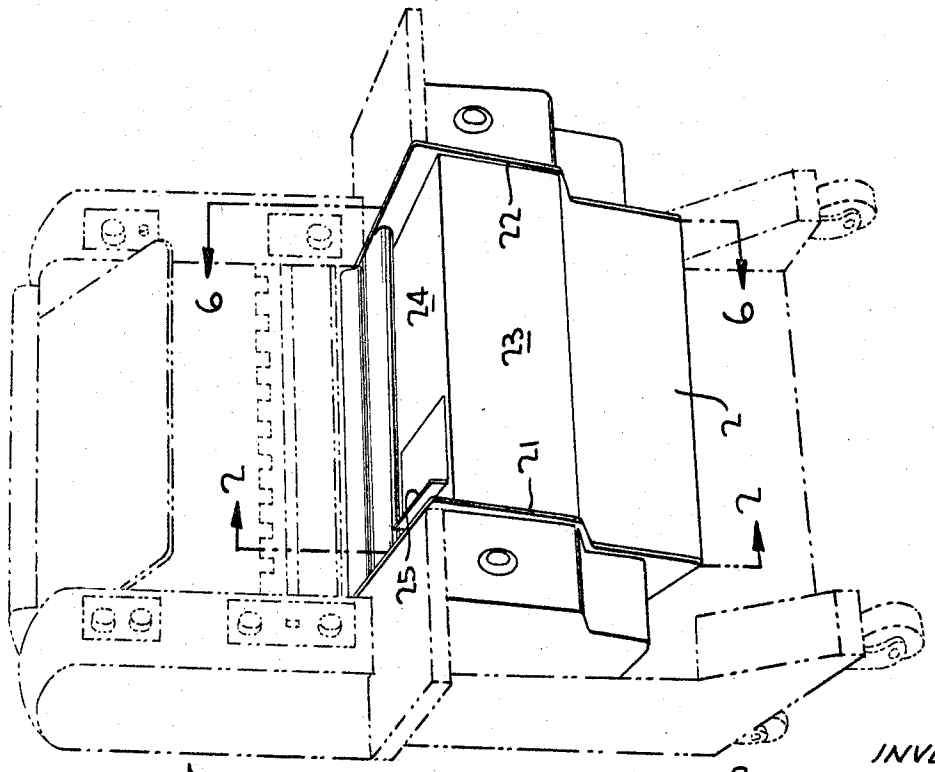


FIG. 1

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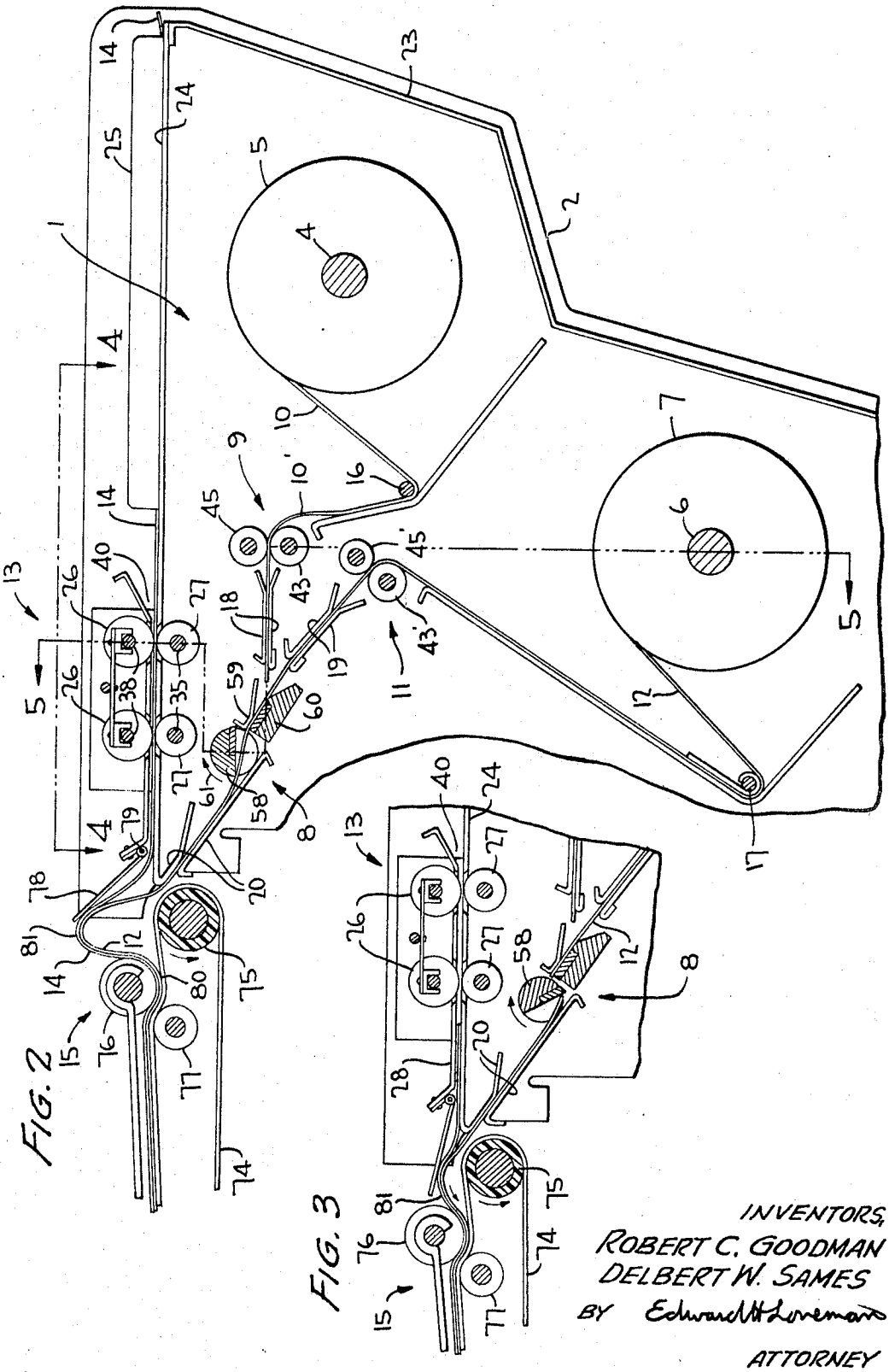

FIG. 2

FIG. 3

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APPARATUS FOR SELECTIVELY FEEDING AND SEVERING WEBS FROM A PLURALITY OF SOURCES

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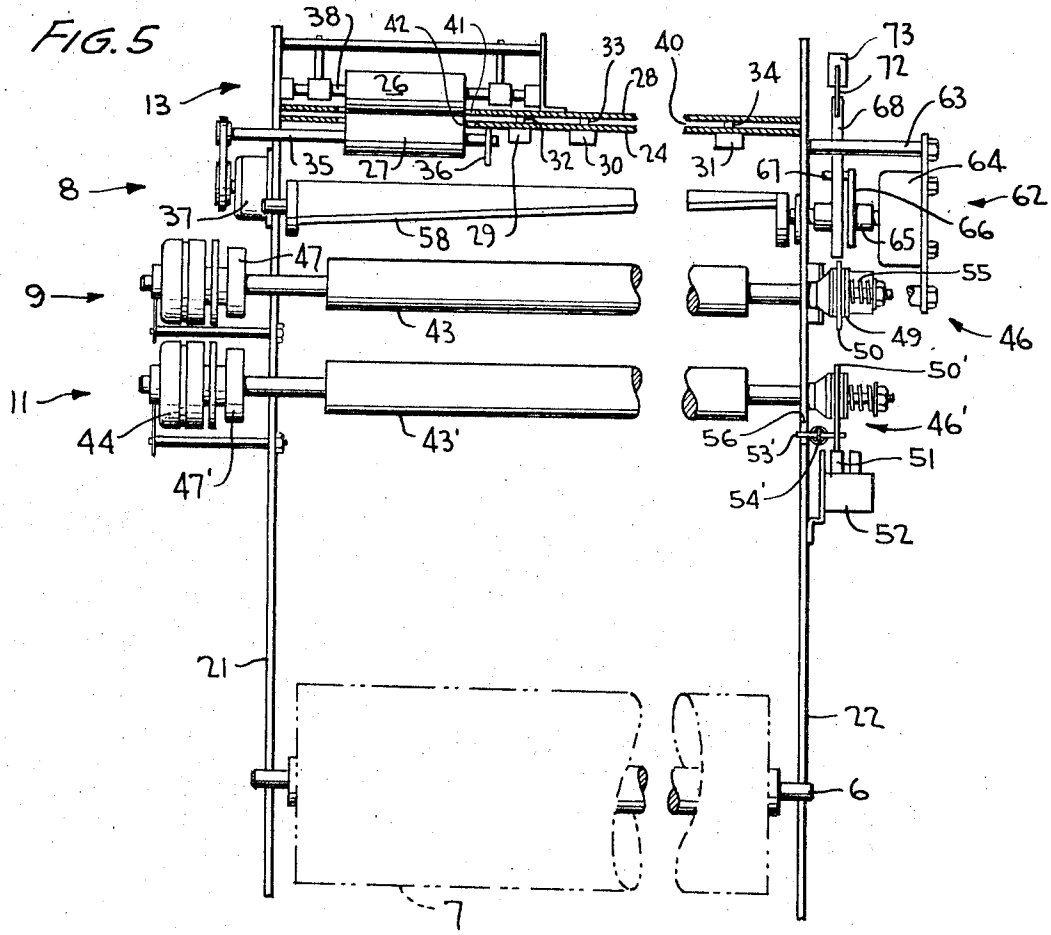
FIG. 5



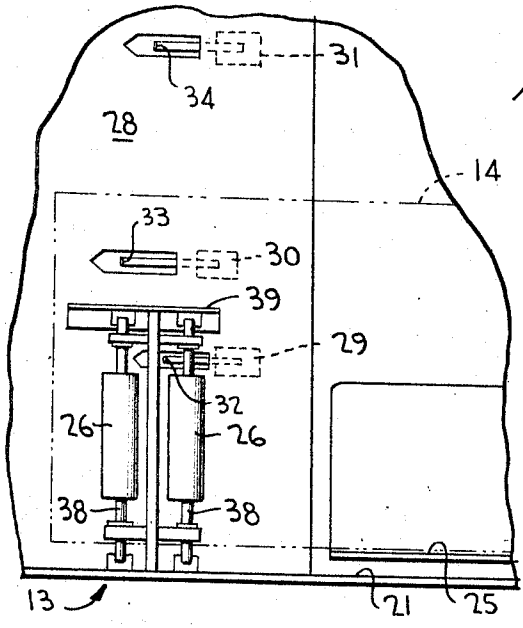


FIG. 4

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APPARATUS FOR SELECTIVELY FEEDING AND SEVERING WEBS FROM A PLURALITY OF SOURCES
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FIG. 6

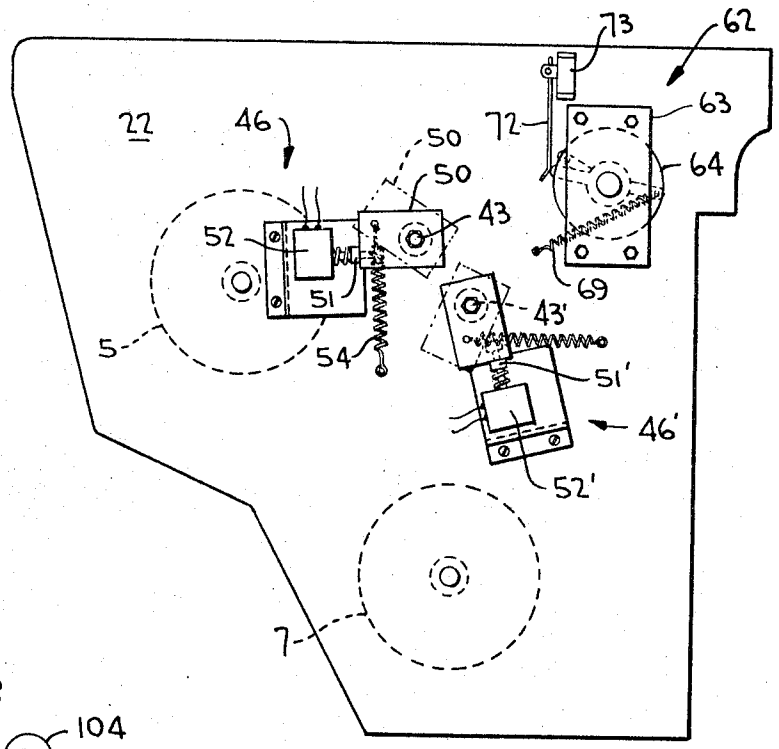
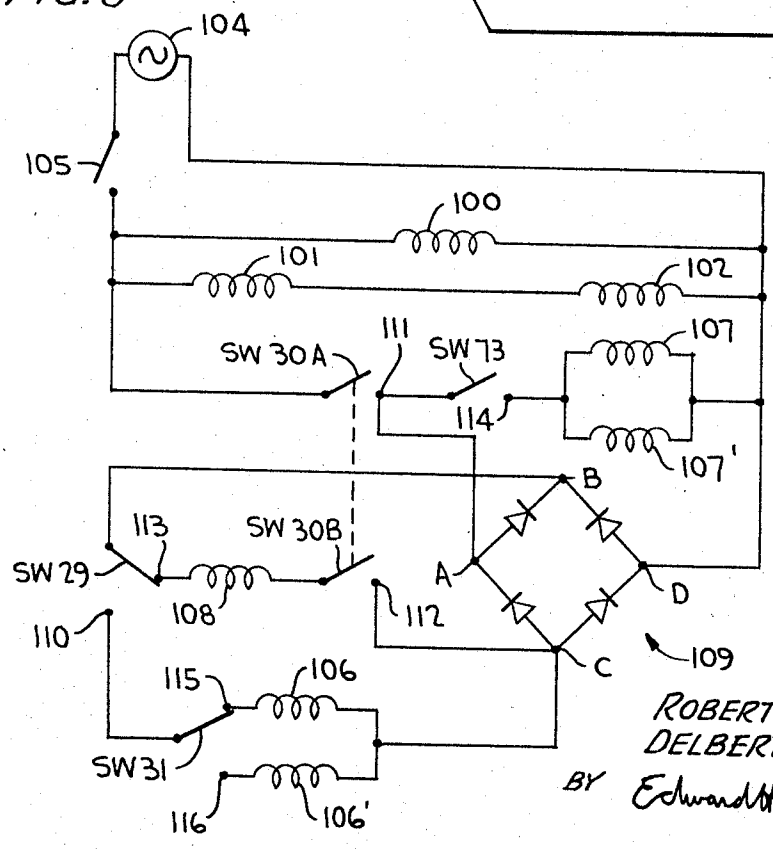


FIG. 8



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United States Patent Office 3,452,627
Patented July 1, 1969

3,452,627

APPARATUS FOR SELECTIVELY FEEDING AND SEVERING WEBS FROM A PLURALITY OF SOURCES

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Filed Nov. 10, 1966, Ser. No. 593,534
Int. Cl. B26d 7/06, 5/20
U.S. Cl. 83—110
3 Claims

ABSTRACT OF THE DISCLOSURE

The present disclosure relates to a method and apparatus for selectively feeding one of a plurality of webs having differing characteristics to a point of use and severing the web to provide a sheet of a desired length in response to sensed conditions. More specifically, the present device is primarily adapted for use in combination with a reproduction machine, wherein one particular width of sensitized copy paper is automatically selected from a plurality of rolls each carrying a different width of paper and thereafter cut to a length corresponding to the length of an original or reference, which is desired to be reproduced by the machine.

The present invention has particular utility when employed to supply sensitized copy paper such as a diazo type paper, from a roll to machines which are adapted to reproduce indicia from a reference or original, and to sever the sensitized copy paper to a length corresponding to the length of the original.

In reproduction machines heretofore available it has been the practice to provide a single supply roll from which lengths of copy paper were severed depending on the length of the reference or original which is to be reproduced. Normally, the width of the supply of copy paper provided was chosen on the basis of the maximum width of the original, e.g. the conventional 19" wide paper. When reproducing originals having smaller widths, such as conventional 11" paper, it was necessary to trim the copy paper to size after development thereof, resulting in waste of an 8" side strip of paper. To prevent such waste, the practice was adopted of restricting interchanging of original widths, that is, requiring the running of only 19" wide originals through the reproducer until the 19" supply rolls was expended, whereafter an 11" supply roll was inserted into the machine and only 11" originals reproduced until that roll was in turn used up. Obviously, this procedure is extremely inconvenient, and oft-times it was found necessary to remove and store partially used supply rolls, when the total length of the originals to be reproduced at any one time was less than that of the copy paper available on the roll.

Accordingly, it is a broad object of the present invention to provide a method and apparatus by which one of a plurality of webs of material having different characteristics may be selectively fed to a point of use and severed to produce a sheet of desired length in response to the sensed condition of a reference or original sheet.

A more specific object of the present invention is to provide a method and apparatus by which one of a plurality of webs of sensitized copy paper, which vary in width, may be selectively and automatically removed from a supply roll and severed to produce a sheet of copy paper which substantially corresponds in width and length to an original which is desired to be reproduced.

A further object of the present invention is to provide in a selective web feeding and severing apparatus, means adapted to automatically withdraw a previously fed web from a web severing station after a sheet has been severed therefrom to prevent jamming due to the presence of such web at the station during subsequent feeding of a different web.

Still another object of the present invention is to provide in a web feeding and severing apparatus, web forwarding means adapted to continuously forward a leading portion of a web while motion of a trailing portion of the web is arrested prior to and during a web severing operation without tensioning the web.

These and other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings in which:

FIG. 1 is a perspective view of a cabinet enclosing the apparatus of the present invention and illustrating the positioning of such cabinet adjacent to a suitable reproduction machine;

FIG. 2 is a left side sectional view taken generally along the line 2—2 in FIG. 1;

FIG. 3 is a fragmentary sectional view taken generally along the lines 2—2 in FIG. 1, but showing the paper web cutter bar in actuated position;

FIG. 4 is a fragmentary top view taken generally along the line 4—4 in FIG. 2;

FIG. 5 is a front elevational view taken generally along the line 5—5 in FIG. 2;

FIG. 6 is a right side elevational view taken generally along the line 6—6 in FIG. 1;

FIG. 7 is an enlarged fragmentary view of the cutter bar actuating assembly viewed in FIG. 6, but having portions removed; and

FIG. 8 is a diagrammatic view of the electrical control circuit employed in the practice of the present invention.

Referring now to the drawings wherein like reference characters designate like or corresponding parts throughout the several views there is shown a selective web feeding and severing apparatus of the present invention, which is generally designated by reference number 1 in FIG. 2 which may be enclosed with any suitable cabinet 2 and employed to selectively feed sheet material having different characteristics and of any desired length to a point of use.

To facilitate understanding of the nature and mode of operation of the apparatus of the present invention, reference is made to its use in feeding sheet material to a reproduction machine, which is illustrated in phantom and generally designated by reference numeral 3 in FIG. 1. Briefly, a reference sheet or original which is to be reproduced is passed in a superimposed relationship with a sensitized copy paper, such as a diazo type paper, to an exposure station, at which position, indicia on the original is fixed on the copy paper. Thereacter, the original is separated from the copy paper and the copy paper is forwarded through a developing station.

The apparatus employed in the practice of the present invention is shown in FIGS. 2 and 3 as generally including: a freely rotatable shaft 4, which is adapted to support an upper supply roll of sensitized paper 5; a freely rotatable shaft 6, which is adapted to support a lower supply roll of sensitized paper 7; a paper web severing station generally designated by reference numeral 8; means, generally designated by reference numeral 9, for feeding a web of paper 10 from supply roll 5 to severing station 8; means, generally designated by reference numeral 11, for feeding a web of paper 12 from supply roll 7 to severing station 8; and a second station generally designated by reference numeral 13 for feeding and sensing an original or reference 14. Preferably, apparatus 1 is also provided with means, generally designated by reference

numeral **15** in FIGS. 2 and 3, which is adapted to forward original **14** in superimposed relationship with a selected web of paper, as for instance web **12** viewed in FIG. 2, to an exposure station, not shown, provided within reproduction machine **3**. Supply rolls **5** and **7** may be employed to hold 11" and 19" paper webs, respectively, which are suitable for use in reproducing originals of conventional 11" and 19" widths.

Any suitable means may be employed to guide paper webs **10** and **12** during passage thereof through apparatus **1**. As by way of example, cylindrical rods **16** and **17** are employed to guide webs **10** and **12** to feeding means **9** and **11**, respectively; pairs of plates **18** and **19** are employed to guide webs **10** and **12** in passing from feeding means **9** and **10** to severing station **8**, respectively; and a pair of plates **20** are provided to guide the webs passing from severing station **8** to forwarding means **15**.

The previously referenced elements of apparatus **1** are mounted on a pair of spaced side supporting plates **21** and **22**, which form part of a cabinet **2** as shown in FIGS. 1 and 2. Cabinet **2** includes front and top cover plates **23** and **24**, which are affixed to respective side plates **21** and **22** in any suitable manner, not shown. An original sheet edge guide **25**, which is affixed to top cover plate **24** by means not shown, is adapted to cooperate with top plate **24** in positioning original **14**, as the latter is presented by an operator to the original sheet feeding and sensing station **13**.

Referring particularly to FIGS. 2, 4 and 5, it will be seen that the original sheet feeding and sensing station **13** generally includes pairs of upper and lower feed rollers **26** and **27**, respectively; an original sheet guide plate **28**; and a plurality of microswitches **29**, **30** and **31** having original sheet sensing fingers **32**, **33**, and **34**, respectively.

Preferably, as indicated in FIG. 5, lower feed rollers **27** are supported on spaced shaft **35**, which are supported by bearings, not shown, provided in side plate **21** and top cover plate flange **36**, and are adapted to be continuously driven by an electric motor **37**. Motor **37** may be mounted on side plate **21** in any suitable manner, not shown. Upper feed rollers **26** are shown as being supported on spaced shafts **38**, which are mounted for free rotational movement within suitable journals mounted on side plate **21** and guide plate flange **39**, respectively. Further, upper feed rollers **26** may, if desired, be spring biased downwardly to permit positive gripping and feeding of original sheet **14**.

In FIGS. 2, 3 and 5 guide plate **28** and top cover plate **24** are shown as being disposed in a parallel, vertically spaced relationship so as to define an original sheet guide slot **40**, and as being punched out, as at **41** and **42**, to permit roller pairs **26** and **27**, respectively, to engage the opposite surfaces of the original sheet **14** passing through the guide slot **40**.

It will be understood by referring to FIGS. 2, 4 and 5 that the original sheet sensing fingers **32**, **33** and **34** are adapted to project into guide slot **40** and to be selectively engaged by original sheet **14** as it is fed through the guide slot **40** by feed rollers **26** and **27**, thereby actuating corresponding switches **29**, **30**, and **31** in succession. The selection of the sheet sensing fingers and thus their respective switches depends only upon the width of such original. In this respect, it will be further understood that when the original **14**, such as a tracing, is to be reproduced, it is first placed on top cover plate **24** in such a manner that the side is in engagement with edge guide **25** and the leading edge, normally either 11" or 19" width, is placed within the front end of the guide slot **40**. Thereafter, an operator pushes the leading edge of the original further into the guide slot until the original is engaged by the first of each pair of feed rollers **26** and **27**, which thereafter automatically feed the original toward forwarding means **15**. It will be seen by viewing FIG. 4, that when feeding an 11" wide original, the leading and trailing edges thereof successively actuate switches **29** and **30**. When reproducing a conventional 19" side original, it will be seen that the leading and trailing edges of the original successively actuate switches **29**, **31** and **30**. The switch arrangement described thus far, is particularly adapted to the sensing of originals having either of two pre-selected widths. However, it will be apparent that any desired number of original widths may be accommodated by providing additional switches at suitably spaced intervals between switches **30** and **31**, and a corresponding number of additional paper supply rolls and paper web feeding means.

Paper web feeding means **9** and **11** are shown particularly in FIGS. 2, 5 and 6. In that such feeding means are of identical construction, like elements are identified by numbers and primed numbers, respectively. Thus, reference is made only to feeding means **9**, which is shown to include in combination: a sensitized paper web feed roll **43**, which is adapted to be driven in a feed direction by an electric motor **44**; a freely rotatable roll **45**, which may, if desired, be spring biased towards roll **43** to insure proper gripping of the fed web; and a feed roll brake and return assembly, indicated generally by reference numeral **46** in FIGS. 5 and 6. Electric motor **44** is shown in FIG. 5 as being mounted on side plate **21** and as being selectively connected to roll **43**, as by an electrically operated clutch **47**.

The roll brake and return assembly **46** is shown in FIGS. 5 and 6 as including first and second brake discs **48** and **49**, which are keyed for rotation with a reduced diameter end portion of feed roll **43**; a brake plate **50**, which is journaled on the reduced diameter end portion of roll **43** and disposed between discs **48** and **49**; a brake plate locking pin **51**; a locking pin retracting solenoid **52**; a brake plate motion limiting pin **53**; and a brake plate return spring **54**. A spring **55** is adapted to bias disc **49** towards the left, as viewed in FIG. 5, thereby tending to maintain discs **48** and **49** in frictional surface engagement with brake plate **50**.

Motion limiting pin **53** is adapted to be received within a slot provided in side plate **22**, shown only as **58'** in FIG. 5, and is adapted to prevent pivotable motion of brake plate **50** beyond the position shown in phantom line in FIG. 6.

Brake plate return spring **54**, which is connected to brake plate **50** through pin **53**, is adapted to return the brake plate from the position shown in phantom to that shown in full line in FIG. 6, when, as will be more fully hereinafter discussed, clutch **47** is de-energized and locking pin retracting solenoid **52** is actuated.

It will be understood that locking pin **51** is normally biased towards an extended position by means of a spring **56** and that it is forced to move to a fully retracted position upon energization of solenoid **52**. The structure described in reference to the roll brake and return assembly is for illustrative purposes only, it being understood that any desired means may be provided to brake, lock and return the driving roll **43** in the manner now to be fully described.

From the foregoing it will be apparent that upon energization of clutch **47**, motor **44** is drivingly connected to feed roll **43** to effect rotation thereof in a counterclockwise direction, as viewed in FIG. 2; to feed paper web **10** towards severing station **8**. Upon initiation of the driving rotation of roll **43**, brake plate **50** is rotated from its rest position into its cocked position shown in phantom in FIG. 6 against the bias of spring **54**, by the frictional driving connection between the brake plate **50** and brake discs **48** and **49**, whereafter the brake plate **50** is permitted to slip with respect to the brake discs. The force of locking pin spring **56** is sufficiently light to allow locking **51** to be partially retracted as the brake plate **50** rotates, however, after pin **53** reaches the end of slot **58**, spring **56** acts to fully extend the locking pin to prevent rotation of the brake plate from its cocked position. After a desired length of paper web **10** has been fed, which corresponds to the length of reference sheet **14**, clutch **47** is

de-energized and solenoid 52 is energized in a timed sequence, by means more fully hereinafter described, to first disconnect feed roll 43 from motor 44 and then retract pin 51 to permit the return brake plate 50 to its rest position. Upon de-energization of clutch 47, brake plate 50 and discs 48 and 49 immediately cooperate to arrest rotation of feed roll 43 in its feed direction. Immediately after stopping of feed roll 43, solenoid 52 is energized to withdraw locking pin 51 from engagement with brake plate 50 to permit the latter to be returned by spring 54 to its rest position. Return motion of brake plate 50 causes rotation of the feed roll 43 in a clockwise direction, as viewed in FIG. 2, to withdraw the leading or severed end of paper web 10 from adjacent severing station 8 and position the web in the manner indicated at 10' in FIG. 2.

In FIG. 2 severing station 8 is shown as including a rotatably supported cutter bar 58 and a pair of spaced apart paper web guides 59 and 60. Guide 60 is adapted to cooperate with cutter bar 58 to shear a paper web presented thereto, such as paper web 12, when bar 58 is rotated in the direction indicated in FIG. 2 by arrow 61. Referring to FIG. 5, it will be seen that cutter bar 58 is journaled adjacent the ends thereof on side plates 21 and 22, and as having an actuating assembly, generally indicated as reference numeral 62, which may be supported on side plate 22 by a suitable bracket 63. From the drawings, it will appear that actuating assembly 62 includes a rotary solenoid 64 having a shaft 65, which is adapted to carry an arm 66 having a pin 67 disposed on the outward extending end thereof. It will be apparent from viewing FIG. 7, that pin 67 is adapted to engage a side surface of an arm 68, which is in turn affixed to a reduced diameter end portion of cutter bar 58. A spring 69 having one end affixed to side plate 22, as by 70, is adapted to normally maintain arm 68 in its rest or full line position shown in FIG. 7, and thus cutter bar 58 is in the position illustrated in FIG. 2.

From the foregoing, it will be apparent that upon energization of solenoid 64, arm 66, and thus pin 67 are caused to move in the direction indicated by arrow 71 in FIG. 7 to move cutter bar arm 68 to the position shown in phantom against the bias of return spring 69. The phantom line position of arm 68 corresponds to the position of cutter bar 58 illustrated in FIG. 3. It will be understood that for the purpose hereinafter discussed, arm 68 shortly after or simultaneously with the severing of the paper web by cutter bar 58, is adapted to engage and deflect finger 72 to close microswitch 73. Upon de-energization of solenoid 64, spring 69 is free to return cutter bar arm 68 and thus assembly 62 to the full line position illustrated in FIG. 7, during which time switch 73 is permitted to open.

Forwarding means 15 is generally shown in FIGS. 2 and 3 as including an endless transfer belt 74; a belt drive roll 75; and upper and lower guide rollers 76 and 77, which are adapted to deflect transfer belt 74 in the manner shown in the drawings to insure positive surface engagement of the paper webs with the conveyor belt and with the reference sheet. If desired, drive roll 75 may be powered by electric motor 37 through any suitable speed reduction transmission, not shown.

Again referring to FIGS. 2 and 3, it will be seen that a guide member 78, which may be of any desired construction, is pivotally supported on guide plate 28, as by hinge pin 79, adjacent the outlet end of reference sheet guide slot 40. It will be apparent that member 78 functions to guide the leading portions of the original and the paper web, as they emerge from the outlet end of guide slot 40 and from between guide plates 20, respectively, into engagement with transfer belt 74 and subsequently into the nip 80 defined by the transfer belt and guide roller 76.

At this point, it will be understood that the linear speed imparted to transfer belt 74 by roller 75 is chosen to be slightly less than the linear speed imparted to reference sheet 14 and paper webs 10 and 12; it being also understood that the same linear speed is imparted to the original 14 and the paper webs 10 and 12, so as to insure registration of the leading edges thereof as they are presented to transfer belt 74. Also it will be noted that, due to the presence of roller 76, belt 74 is slightly inclined in the direction of travel thereof. This, coupled with fact that the paper web is forced to bend in passing over drive roll 75, produces a controlled instability in the superimposed original and paper web, which when the leading edges thereof enter nip 80, causes the controlled formation of a loop or bump 81. Thus, it will be apparent that the size of loop 81 increases in proportion to the length of paper web fed prior to the severing thereof, due to the difference between speed of belt 74 and the speed at which the original and paper web is forwarded thereto. As will become clear, the difference in such speeds is determined by the minimum loop size necessary to arrest the trailing edge of the paper web and thereby prevent tensioning of the paper web, during severing, when the forward end of the web is bing positively transported between belt 74 and roller 76.

For extremely long originals, it may be desirable to incorporate in the apparatus a microswitch or the like, not shown, which is adapted to sense the presence of the loop and control the speed of belt 74, so as to maintain the size of the loop within desired limits.

By permitting the formation of loop 81, it will be seen that the original sheet and paper web may be continuously forwarded by belt 74 through nip 80 without tensioning the paper web, and moreover the loop 81 permits the trailing edge of the paper web to be stationary during the operation of cutter bar 58. This arrangement is desirable from the standpoint that the original sheet and paper web need not be stopped for the cutting operation but may be continuously forwarded to and through an exposure station of the reproduction machine 3 at a constant predetermined speed to insure uniform printing.

Loop 81 is shown in FIG. 3 as being progressively reduced in size subsequent to the termination of paper web feeding, but is preferably not completely removed during the severing operation.

An electrical control circuit suitable for use in the practice of present invention is shown diagrammatically in FIG. 8. Briefly, the circuit is shown as including coils 100, 101, and 102 for energizing original sheet and transfer belt drive motor 37 and paper web drive motors 44 and 44', respectively. Coils 100–102 are energized from a suitable source of electrical power 104, when member switch 105 is closed by an operator. Further, the circuit is shown as including coils 106, 106' for energizing electrical clutches 47, 47'; coils 107, 107' for energizing locking pin retracting solenoids 52, 52'; and coil 108 for energizing cutter bar actuating solenoid 64. Also, it will be seen that the contact arms of microswitches 29, 30, 31 and 73, are referenced in FIG. 8, as SW30A–SW30B, SW31 and SW73, respectively, and are normally in the position shown when no original is present in the feeding and sensing station 13. The circuit also includes a bridge rectifier 109 having terminals A, B, C, and D.

Understanding of the operation of the electrical circuit shown in FIG. 8 may best be had by referring to the overall operation of the feeding and severing apparatus of the present invention.

To initiate operations of apparatus 1, an operator first closes master switch 105 to energize motors 37, 44 and 44' whereafter transfer belt 74 and original feed rollers 27 are driven continuously. Due to the normally open position of switch arms SW30A, SW30B, coils 106 and 106' of clutches 47, 47' are not energized and thus motors 44 and 44' remain disconnected from copy paper web feed rolls 43 and 43'.

Assuming in the first instance that supply rolls 5 and 7 carry paper webs of 11" and 19" widths, respectively,

and that an 11" size original is desired to be duplicated, the operation continues as follows. The operator first places one edge of the original against edge guide **25** and guides the leading edge thereof forward into guide slot **40** to permit rollers **26, 27** to pick up the original and feed same towards the left, as viewed in FIG. 4. Immediately after feeding is initiated, the leading edge of the original engages in succession sensing finger **32** of microswitch **29** to move contact arm SW**29** into engagement with contact **110**, and sensing finger **33** of microswitch **30** to move contact arms SW**30**A and SW**30**B into engagement with contacts **111** and **112**, respectively. The closing of arm SW**30**A on contact **111** establishes a circuit through bridge rectifier terminals A–B, coil **106** and bridge rectifier terminals C–D, whereupon clutch **47** is energized to drivingly connect motor **44** to roll **43** to feed copy paper web **10** through severing station **8** towards transfer belt **74**, whereby the leading edges of the original and copy paper web are aligned with the original overlying the web, and loop **81** is formed. Upon initial rotation of roll **43** in its paper web feed direction, brake plate **50** is moved into its phantom line or cocked position and is locked therein by locking pin **51**.

Feeding of paper web **10** continues until the trailing edge of the original disengages sensing finger **32** of microswitch **29** to move arm SW**29** out of contact with contact **110** to break the circuit through coil **106** and into engagement with contact **113** to establish a circuit through bridge rectifier terminals A–B, solenoid actuating coil **108** and bridge rectifier terminals C–D. Breaking of the circuit through coil **106**, de-energizes clutch **47** to disconnect motor **44** from feed roll **43**, thereby permitting brake plate **50** and brake discs **48, 49** to stop roll **43** and arrest motion of paper web **10**. The establishing of a circuit through coil **108** energizes solenoid **64** which rotates cutter bar **58** to sever paper web **10**; forward motion of the paper web continuing during the period of the time required to rotate cutter bar into severing position, although the terminal end which is being severed is stationary because of loop **81**. Sensing finger **32** of microswitch **29** is positioned with respect to severing station **8**, so as to permit paper web **10** to be severed into a sheet length corresponding in length to the original to be reproduced.

Upon rotation of cutter bar **58** past its severing position, arm **68** which is carried on cutter bar, engages finger **72** of microswitch **73** to close contact arm SW**73** on contact **114** which establishes a circuit through coils **107** and **107'**. The establishing of a circuit through coils **107** and **107'** engages solenoids **52, 52'** to retract locking pin **51** from engagement with brake plate **50**, thereby permitting spring **54** to return the brake plate to its original position. Due to the frictional driving connection between brake plate **50** and discs **48, 49** paper web feed roll **43** is counter-rotated to withdraw the severed end of paper web **10** from adjacent cutter bar **58**.

Subsequently the trailing edge of the original disengages sensing finger **33** of microswitch **30** to move contact arms SW**30**A and SW**30**B out of engagement with contacts **111** and **112** to break the circuits through coil **108** and coils **107, 107'**. Breaking of the circuit through coil **108** disengages solenoid **64**, thereby permitting spring **69** to return arm **68** and thus cutter bar **58** to its initial position. During return of arm **68** to its initial position, finger **72** of microswitch **73** is released to permit arm SW**73** to be disengaged from contact **114**. Opening of either of arms SW**30**A or SW**73** breaks the circuit through coils **107, 107'** to de-energize solenoids **52, 52'** and permit springs **56, 56'** to return locking pins **51, 51'** to their initial position.

When reproducing a 19" wide original, the operation of the electrical control circuit and apparatus **1** is substantially identical with that described with reference to the 11" wide original, except that the leading and trailing edges of the original actuates all three of microswitches **29, 31** and **30** in succession. Actuation of microswitch **31** acts to disengage arm SW**31** from contact **115** and close it on contact **116**. Thereafter, when microswitch **30** is actuated in the manner described, a circuit is established through coil **106'** to permit driving connection of motor **44'** to feed roll **43'**.

It should also be understood that the foregoing relates to only a preferred embodiment of the invention, and that it is intended to cover all changes and modifications of the example of the invention herein chosen for the purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

The invention claimed is:

1. An apparatus having a web-feeding and severing assembly including a plurality of feeding means, each having a web and each of said feeding means being adapted, when activated, to present its respective web to a web-severing station having a severing means adapted to cut a length of material from the web presented thereto equal in length to a reference sheet; a transport means having feed means and guide means for feeding and guiding a reference sheet through said web-severing station, a continuously driven forwarding means; and an arresting means for stopping said feeding means and web prior to the severing of said web; said guide means being adapted to lead said reference sheet and said web in superimposed position to said continuously driven forwarding means, which continuously driven forwarding means is operated at a linear speed less than the linear speed imparted to said web and said reference sheet.

2. An apparatus as claimed in claim **1**, including continuously driven forwarding means having an endless belt and a freely rotatable guide roll disposed in surface engagement with said belt and acting to form a nip therewith, and said guide means being adapted to guide said superimposed reference sheet and web onto said belt and through said nip; and reverse means for reversing the travel of said feed means of said web in order to retract said web from said web-severing station after a length of material is severed therefrom.

3. An apparatus as claimed in claim **1**, including means for transferring said web from said web-severing station to a point of use having an endless conveyor belt and a freely rotatable guide roll being disposed in frictional surface engagement with said belt and adapted to form a nip therewith; a guide means adapted to guide said leading portion of said web and reference sheet from said web-severing station onto said belt and into said nip; said guide means being disposed to allow a loop to be formed in said reference and said web.

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U.S. Cl. X.R.

83—205, 210; 95—1.7, 31; 101—228, 233; 118—6