July 11, 1967 L. BENTZMAN 3,330,458

REMOVABLE PRESSURE ROLLER MECHANISM

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FIG. 1

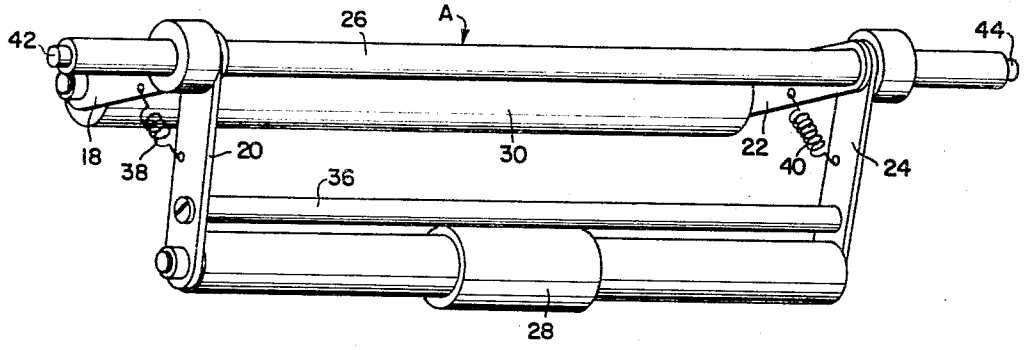


FIG. 2

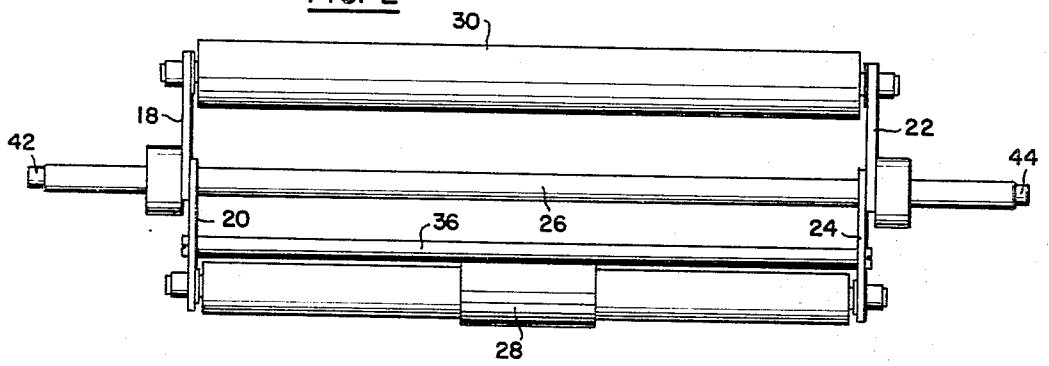
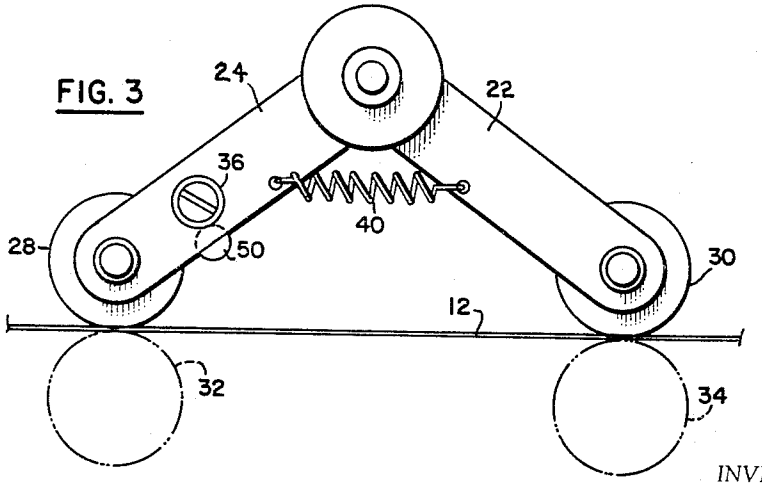


FIG. 3



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REMOVABLE PRESSURE ROLLER MECHANISM

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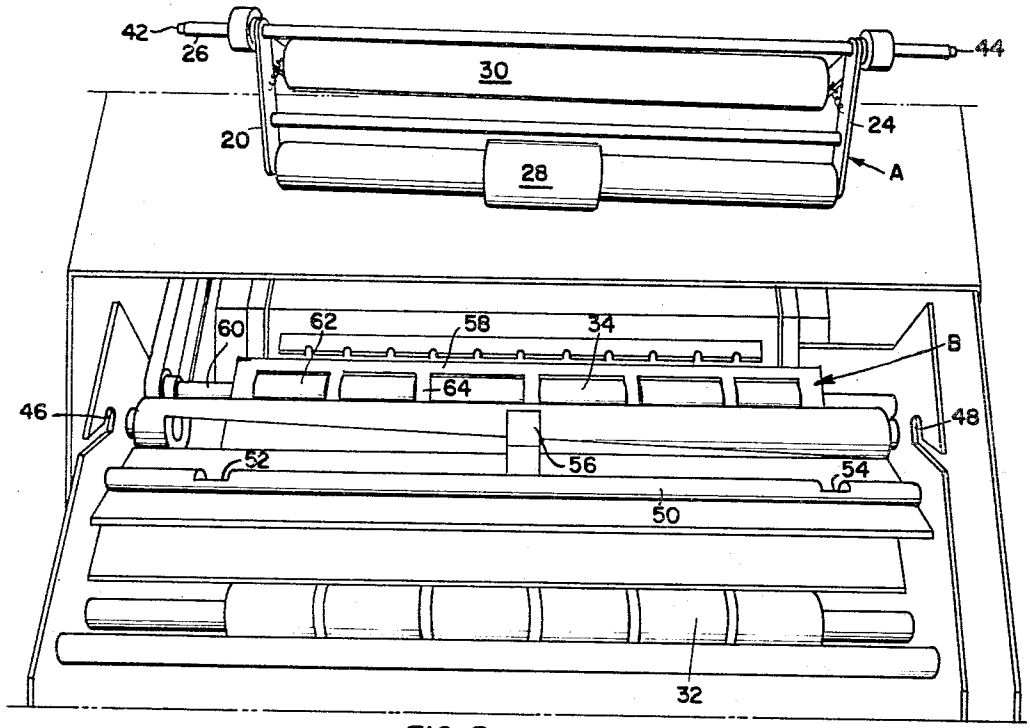


FIG. 5

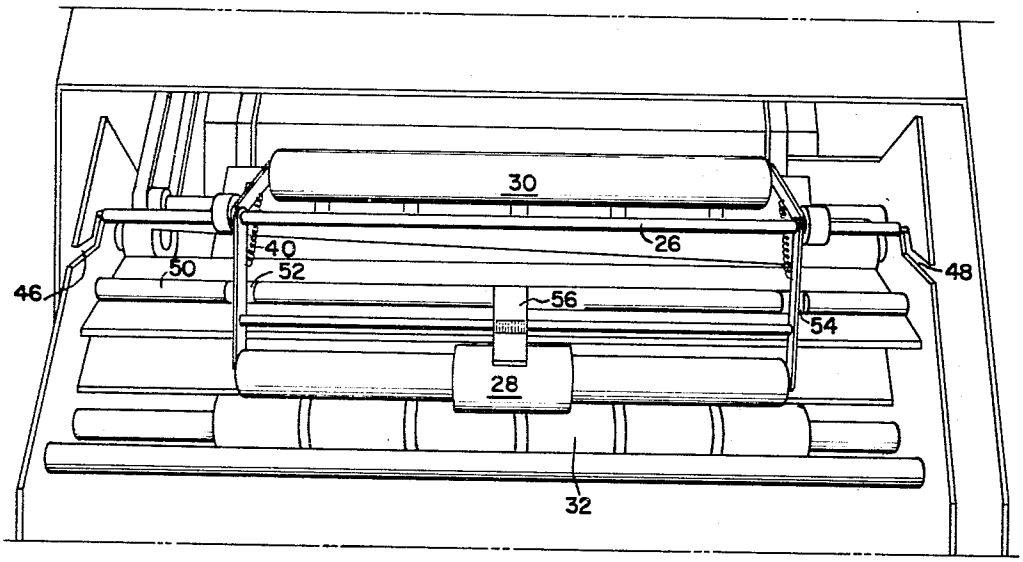


FIG. 4

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REMOVABLE PRESSURE ROLLER MECHANISM

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3 Claims. (Cl. 226—90)

This invention relates broadly to the art of electrostatic copy machinery and is more particularly directed to the field of transporting copy paper in roll form through a machine quickly in response to copy demand.

The instant invention is concerned with an office type of electrostatic copy machine designed to produce a large number of copies from an original of any convenient size. In order to quickly accommodate requirements for great numbers of copies when these copies can be of varying sizes in the instant associated machine, copy paper in roll form is fed into the copier and a solenoid operated knife separates the roll into properly sized sheets in response to the instructions of the operator. It is contemplated that the instant invention will find utility in a copy machine capable of a high rate of reproduction wherein the paper must achieve a high velocity in its travel through the machine.

It is commonly known that when feeding papers, film and similar rolled products through a mechanism, jams frequently occur due to breakage or mechanical malfunctions. When this happens, the removing of the jammed material from a complex mechanism usually presents a severe problem.

It is therefore an object of this invention to provide a roller assembly designed to permit easy removal of jammed material from an electrostatic copy machine.

It is another object of this invention to provide a novel paper roller mechanism incorporating means to easily expose the transported paper as it is fed into a machine.

In prior art machines of the type set forth, a paper jam usually caused a major breakdown that required the services of a skilled mechanic in order to clear the problem. Most prior art copy machines include complicated paper transport facilities located deep within the equipment itself. Once a jam occurred, the machine had to be taken out of service for a considerable period of time causing great delays, loss of money and vexations on the part of the owner.

It is therefore a further object of the instant invention to provide a roller assembly including spring biased compression rollers cooperatively joined in a separately removable assembly.

It is another object of this invention to provide a novel paper transport roller assembly that may be readily removed by unskilled operators upon the occurrence of a paper jam.

It is another object of this invention to provide a novel paper transport roller assembly that may be separately removed to clear a paper jam without the necessity of disassembling a major portion of the enclosing apparatus.

Many prior art photo copy machines that incorporate paper transport rollers also suffer from other problems stemming from the use of high speeds and quantities of roll paper. In such machines, it is a common happening upon the occurrence of a breakage to have the paper wrap around the roller and thereby cause a jam that is especially difficult to clear.

It is another object of this invention to provide a novel paper transport roller assembly incorporating stationary construction to eliminate the possibility of paper wrap around upon the occurrence of a breakage.

It is another object of this invention to provide a novel paper transport roller assembly provided with a plurality of transverse paper inhibiting fingers to preclude the possibility of the paper wrapping itself about the roller and thus causing a jam.

It is another object of this invention to provide a novel paper transport roller assembly that is rugged in construction, simple in operation and trouble free upon use.

Other objects and a fuller understanding of the invention will be had by referring to the following description and claims of a preferred embodiment thereof, taken in conjunction with the accompanying drawings wherein like reference characters refer to similar parts through the several views and in which:

FIG. 1 is a front perspective view of a roller assembly constructed in accordance with the instant invention with the spring in untensioned position.

FIG. 2 is a top plan view thereof.

FIG. 3 is a side elevational view thereof in roller contact with the spring in tensioned position.

FIG. 4 is a top perspective view of the roller assembly in place in a photo copy machine.

FIG. 5 is a top perspective view of the invention with the roller assembly removed to expose the interior features of the forward end of the photo copy machine.

Although specific terms are used in the following description for the sake of clarity, these terms are intended to refer only to the particular structure of my invention selected for illustration in the drawings and are not intended to define or limit the scope of the invention.

Referring now to the drawings, I show a novel removable roller assembly generally designated A and a stationary stripper bar generally designated B for use within a copy machine wherein the copy paper 12 is rapidly fed for copying purposes from a roll of paper (not shown) that is stored in another part of the machine. As best seen in FIGS. 4 and 5, the paper feeds from the roll to the roller assembly A wherein it is cut to any of several predesignated sizes by a solenoid actuated rotary knife 16 in response to signals received from the operator.

As best seen in FIGS. 1–3, the roller assembly A comprises spaced pairs of roller links 18, 20 and 22, 24 pivotally joined respectively at one end to permit rotative motion of the rollers 28, 30 about the main shaft 26. The input nip roller 28 is rotatively carried between the links 20, 24 at their respective free ends on bearings of suitable design to permit free rotation in response to frictional forces from the driving input roller 32. An output nip roller 30 is rotatively carried between the links 18, 22 at their respective free ends on bearings of suitable design to permit free rotation in response to frictional forces from the driving output roller 34.

A transverse tie bar 36 joins the links 20, 24 to form a sturdy assembly by providing a fixed member. The spaced extension springs 38, 40 respectively bias links 18, 20 and 22, 24 together to the untensioned position indicated in FIG. 1 when the assembly is removed from the machine 10. When installed, the main shaft extensions 42, 44 ride downwardly in right and left bayonet slots 46, 48 and then forwardly until firmly seated in the slot recesses. In this manner, the input roller 28 and the output roller 30 are respectively urged into firm, frictional, rotative contact with the driven input roller 32 and driving output roller 34. It will be observed that the links 18, 20 and 22, 24 pivotally open about the main shaft 26 against the bias of the springs 38, 40 as the extensions 42, 44 are downwardly seated into position. A transverse cam bar 50 pivotally mounts across the copier 10 in a position suitable to contact the forward links 20, 24. Flat cut out bar sections 52, 54 are spaced to underlie the forward links and a conveniently located operating handle 56 rotates the cam bar when desired.

As best seen in FIGS. 4 and 5, when the roller assembly A is in operating position, the undercut flat surfaces **52**, **54** are turned through the handle **56** to underlie the links **20**, **24** without contact, thereby permitting the engagement of the shaft extensions **42**, **44** within the slots **46**, **48** to pull the rollers **28**, **30** into close contact. When it is desired to thread a sheet of paper **12** between the input rollers, the handle **56** is turned and the cam bar **50** is rotated until the curved portion thereof contacts the links **20**, **24** and thus raises the input roller **28**. When the threading operation is completed, the cam bar is returned to its initial position and the springs **38**, **40** pull the roller **28** back into frictional contact with the driving roller **32**.

Referring now to FIG. 5, it will be seen that the stripper assembly B comprises the driving output roller **34** and a fingered platform **58** in cooperative arrangement. The roller **34** is segmented into a plurality of small rollers **62** which are all rotated in unison by the driving shaft **60**. The individual rollers **62** are spaced sufficiently to permit the platform fingers **64** to extend therebetween without touching or binding. The fingers **64** will absolutely prevent the leading edge of the paper **12** from wrapping about the output roller **34**.

It will thus be seen that roller assembly has been constructed to be readily removable simply by urging the shaft extensions **42**, **44** out of their retaining slots **46**, **48**. Once the removal action has been initiated, the bias of the springs **38**, **40** will aid disassembling the parts. In the event of a paper jam, means have thus been provided to quickly and easily get to the source of the trouble without the need of any special tools or special skills whatsoever. By providing the plurality of spaced fingers extending between the individual rollers **62**, a simple and inexpensive platform has been constructed that permits unimpaired roller operation and at the same time, prevents wrap around of materials on the roller in the event of breakage or malfunction.

Although I have described my invention with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereafter claimed.

What is claimed is:

1. In a removable pressure roller mechanism feeding paper through a machine, the combination of

a main shaft;

a pair of left roller links pivotally carried by the said shaft,

said links being spaced from the left end of the said shaft;

a pair of right roller links pivotally carried by the said shaft,

said links being spaced from the right end of the said shaft;

an input roller rotatively supported between the forwardmost left links and the forwardmost right links;

a driven output roller rotatively carried between the other of said left links and the second of said right links;

spring means biasing the said right and left links respectively pivotally together about the said main shaft;

releasing means built into the said machine,

said means removably securing the said main shaft,

said means utilizing the bias of the said spring means; and a cylindrical cam bar transversely secured to the said machine beneath the said forwardmost right and left links,

said cam bar being cut to provide flat bar sections underlying the said forwardmost links,

said cam bar having an initial position wherein the rounded surface contacts the said forward links and raises them against the bias of the said spring means,

said cam bar having a second position wherein the said flat bar sections contact the said forward links thereby permitting the spring means to pull the attached input roller to a lower position.

2. The invention of claim **1** wherein the said releasing means include slotted means adapted to receive the respective ends of the said main shaft, the said slotted means being cut to provide downwardly positioned right and left bayonet slots and which downwardly respectively terminate in forwardly extending recesses.

3. The invention of claim **1** and a driving output roller in rotating contact with the said driven output roller, the said driving output roller being divided into a plurality of spaced roller segments and a paper restraining platform associated with the said driving output roller, said platform supporting a plurality of spaced fingers, said fingers extending through the spaces between the said roller segments whereby paper is prevented from wrapping around the said driving output roller.

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