United States Patent [19]

Napor et al.

[11] **3,712,553**

[45] **Jan. 23, 1973**

[54] FILM SCROLL WINDING MACHINE

[75] Inventors: **Carl A. Napor**, Glen Ridge; **Charles G. Krumm**, Wyckoff, both of N.J.

[73] Assignee: **Kahle Engineering Company**, Union City, N.J.

[22] Filed: **March 19, 1971**

[21] Appl. No.: **126,243**

[52] **U.S. Cl.** .....**242/56 R**, 242/67.3 R, 242/75.52

[51] **Int. Cl.** **B65h 19/26**

[58] **Field of Search** .....242/56 R, 56 A, 67.2, 67.3, 242/75.51, 75.52; 29/430; 156/543

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Primary Examiner—George F. Mautz
Assistant Examiner—Edward J. McCarthy
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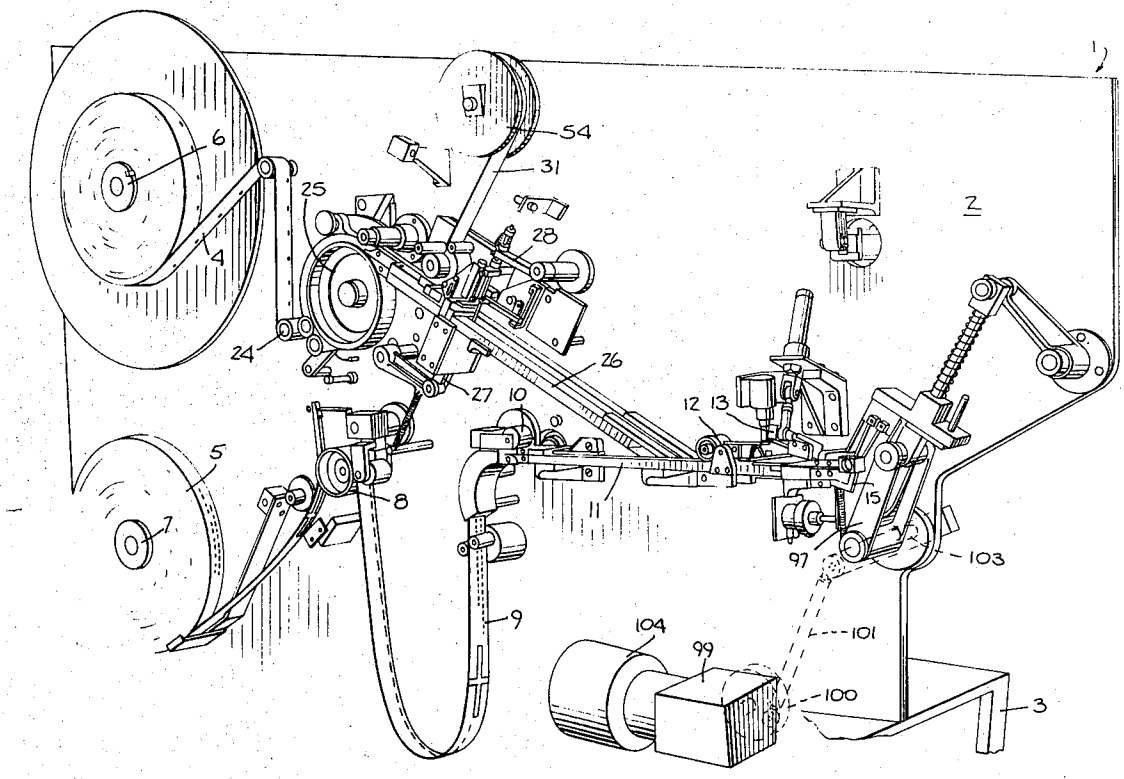
[57] **ABSTRACT**

An improved machine is described for automatically winding scrolls of interwound backing paper and sensitized film and for transferring the wound scrolls to a film cartridge loading or other machine. The machine mounts rolls of perforated sensitized film and backing paper which are fed through stationary converging tracks to a common track along which they pass in abutting relationship to a slotted scroll winding arbor. Automatic controls count the film and paper perforations to check the position and lengths of strips cut from the rolls. The output of the machine is increased by utilizing the scroll winding movement of the arbor for one scroll to simultaneously advance the paper strip for the next scroll.

23 Claims, 16 Drawing Figures



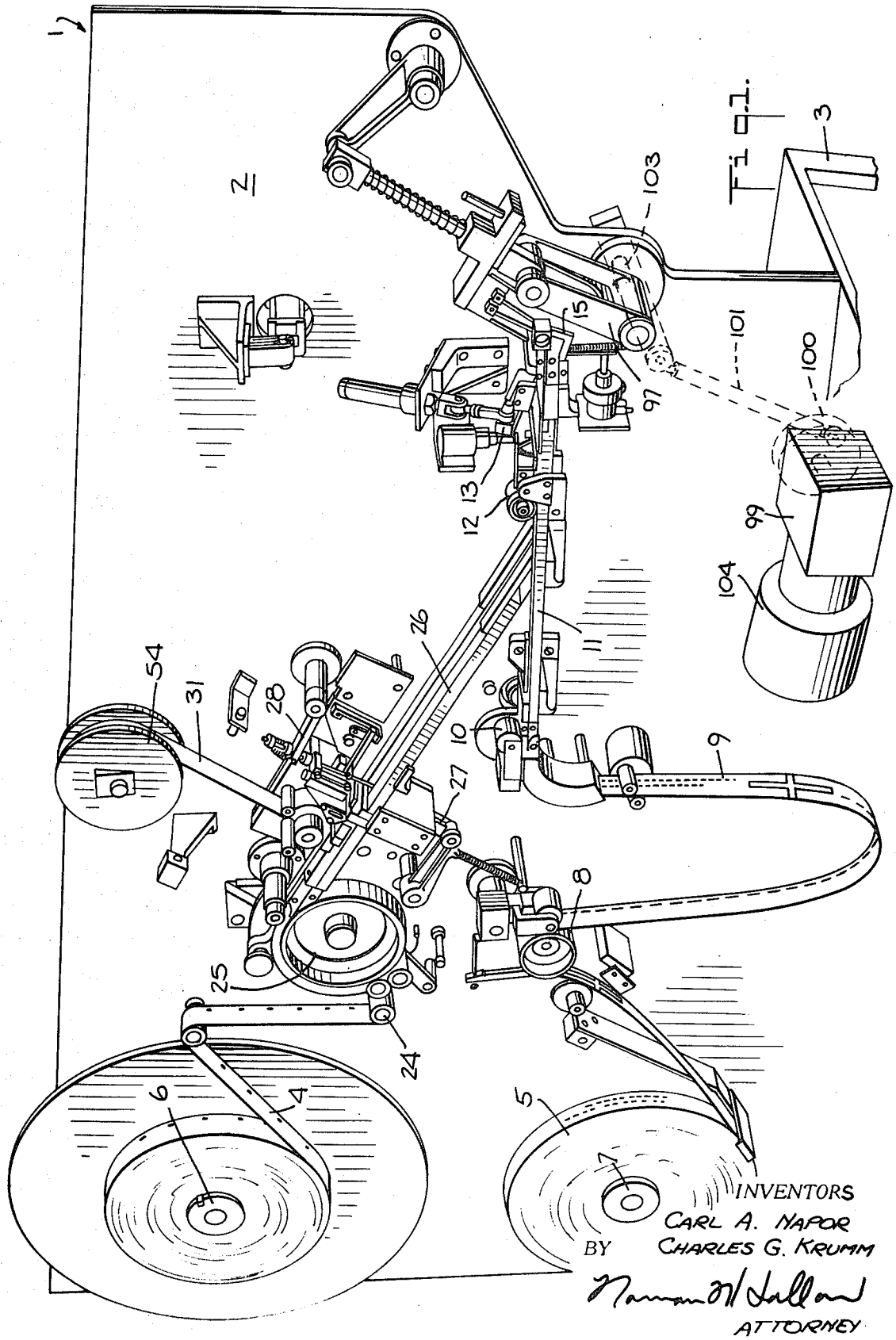


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Fig. 2.

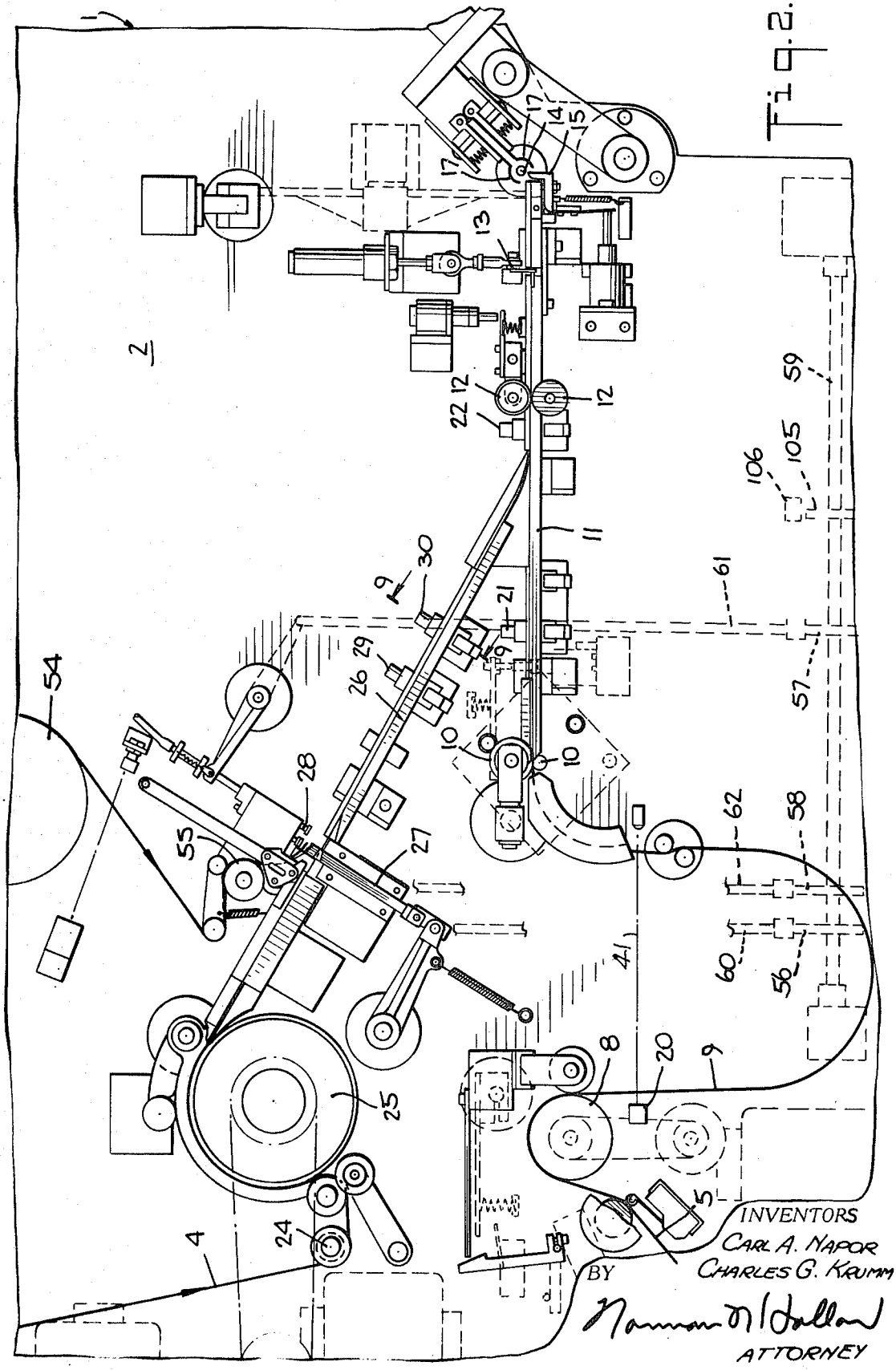

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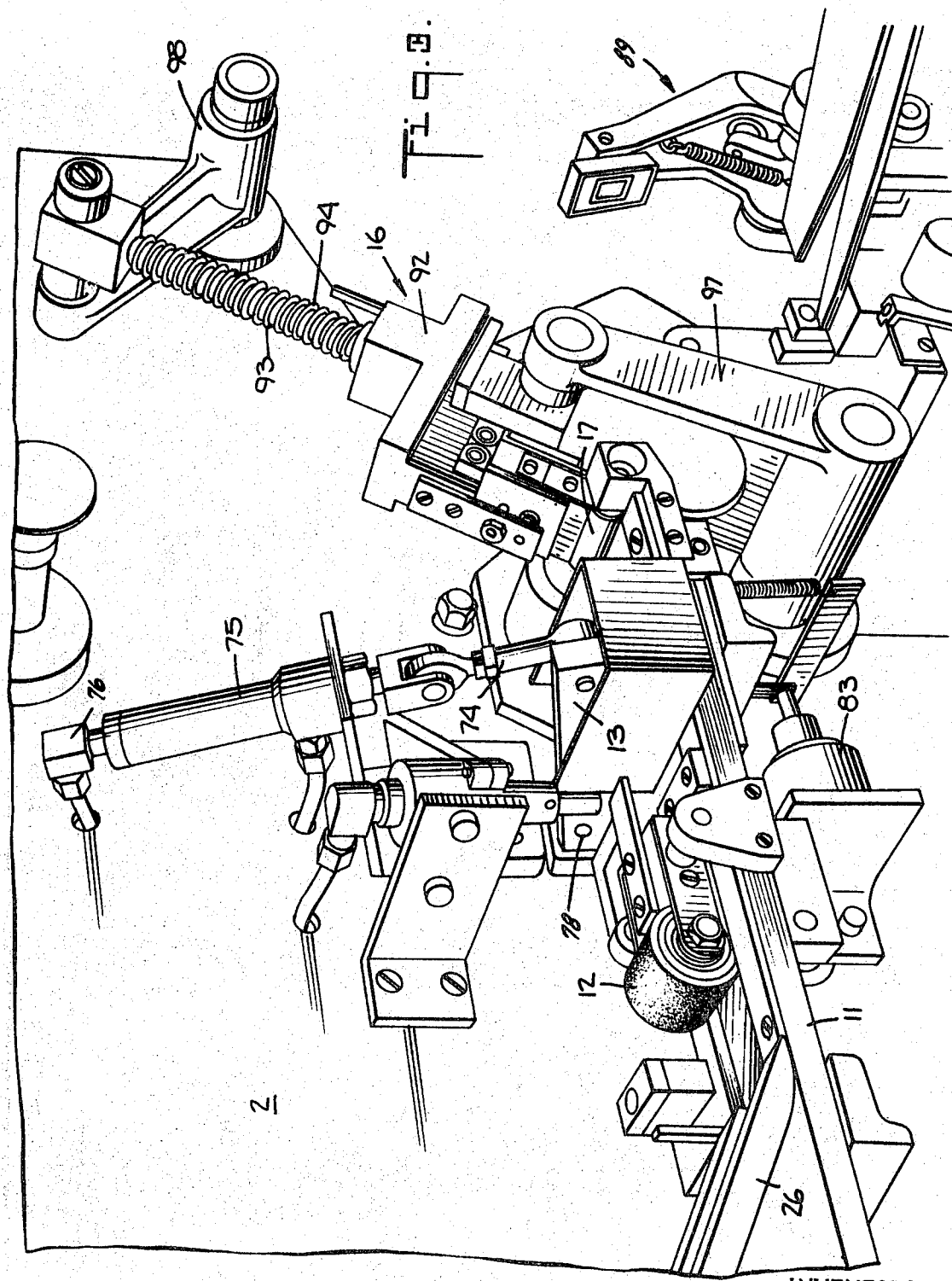
Fig. 3.



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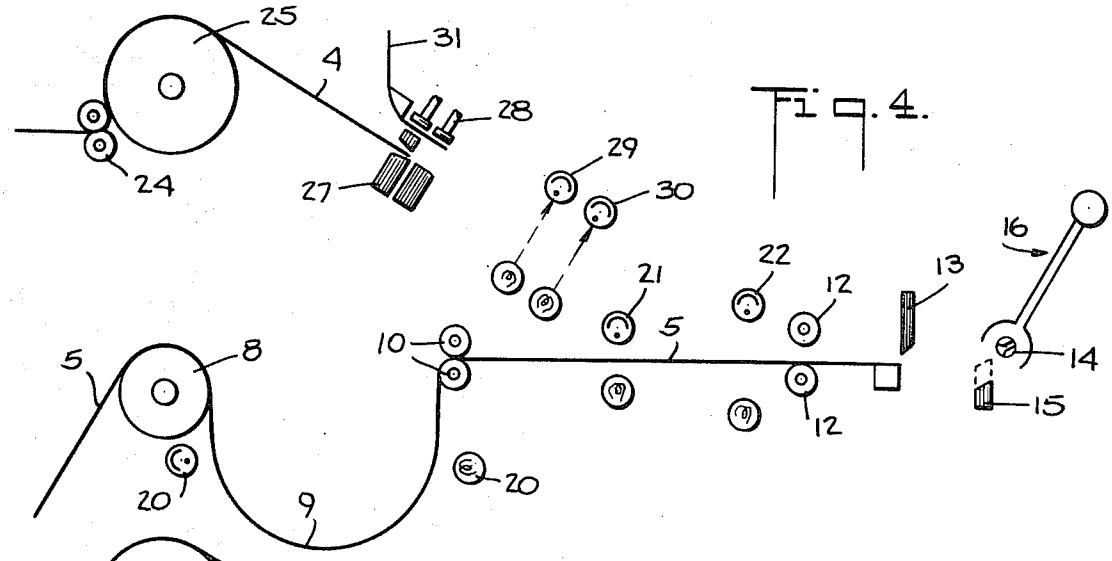

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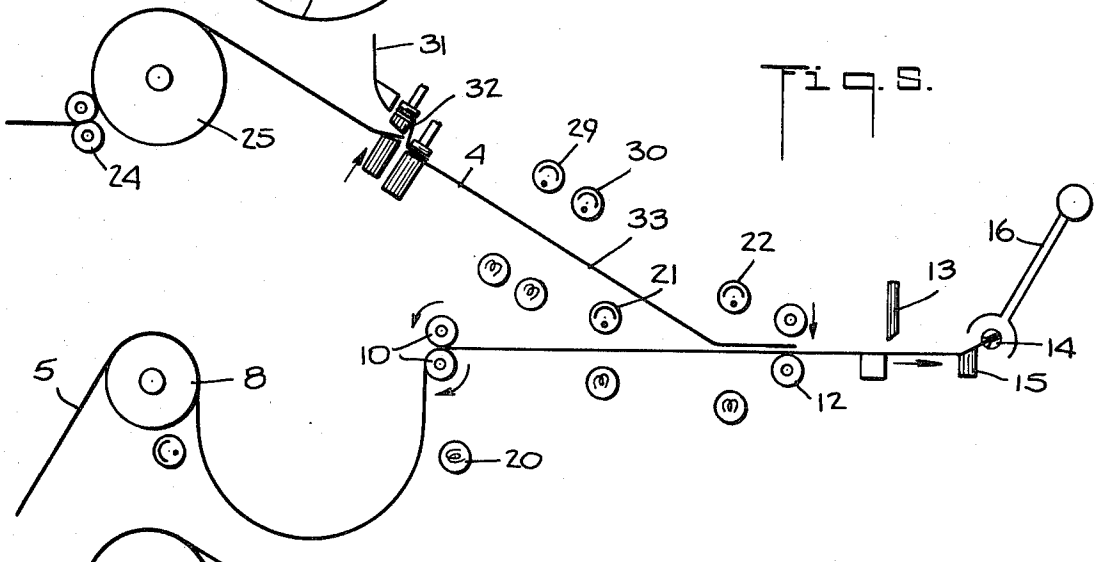

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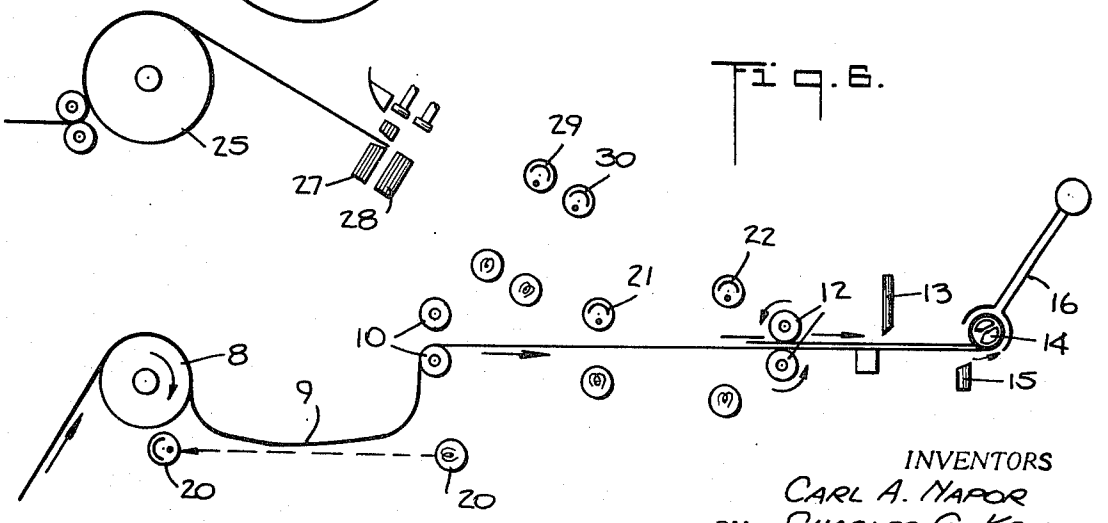

Fig. 6.

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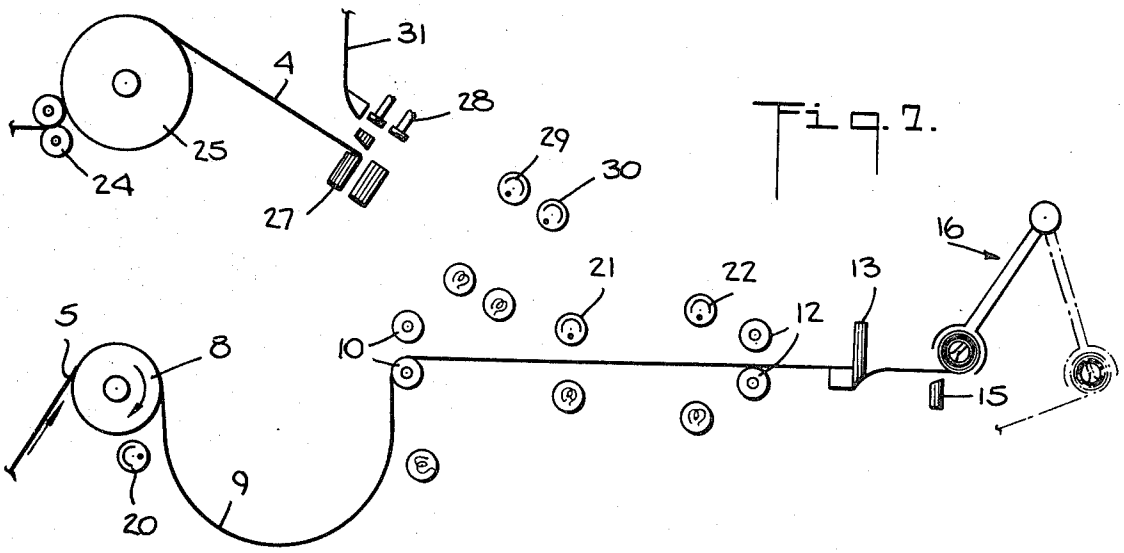
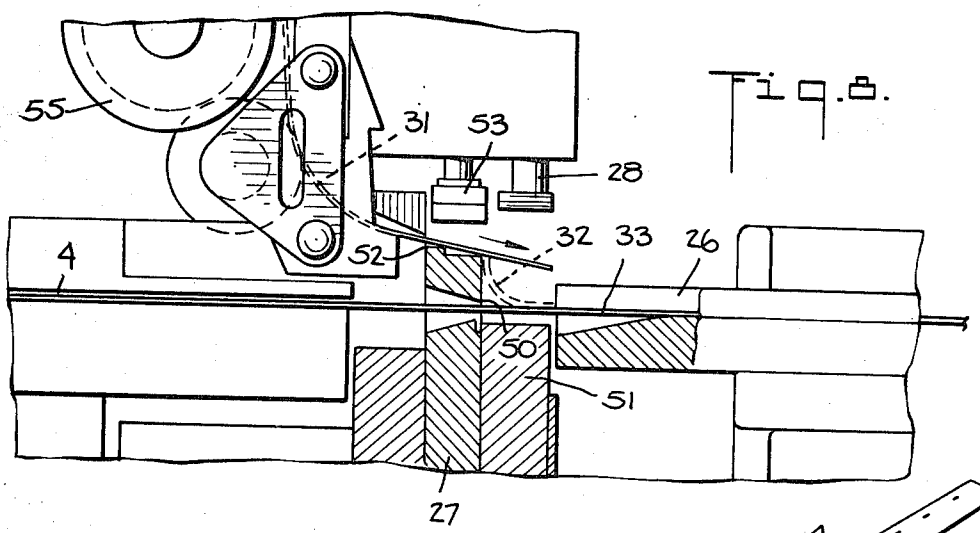


Fig. 7.



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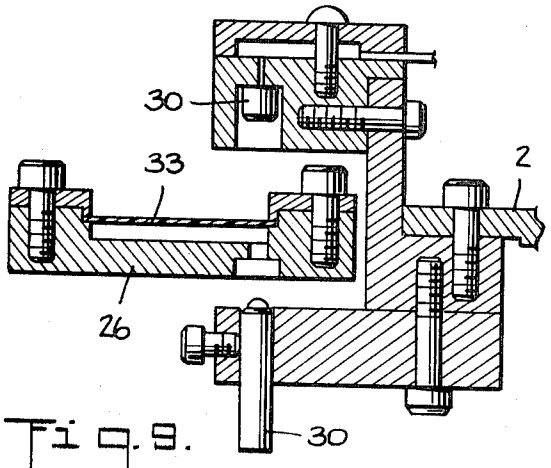

Fig. 9.

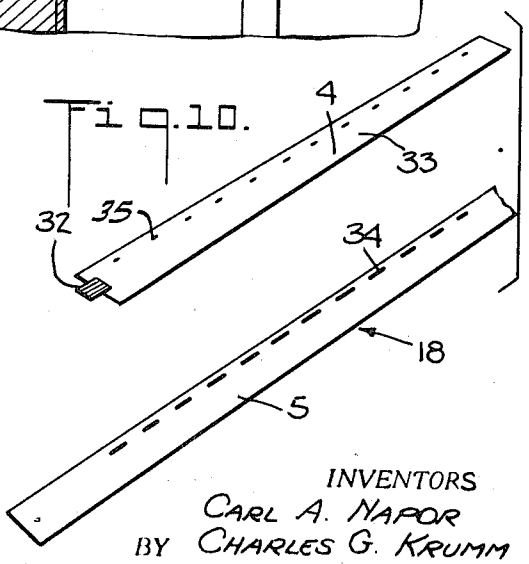

Fig. 10.

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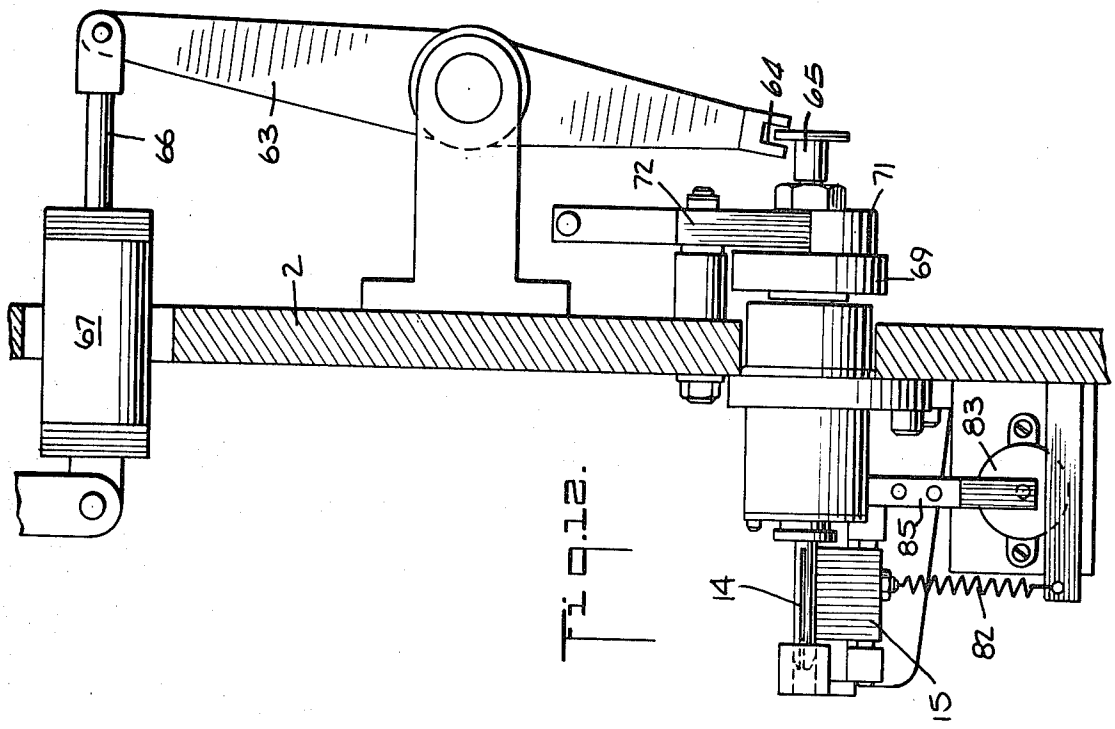
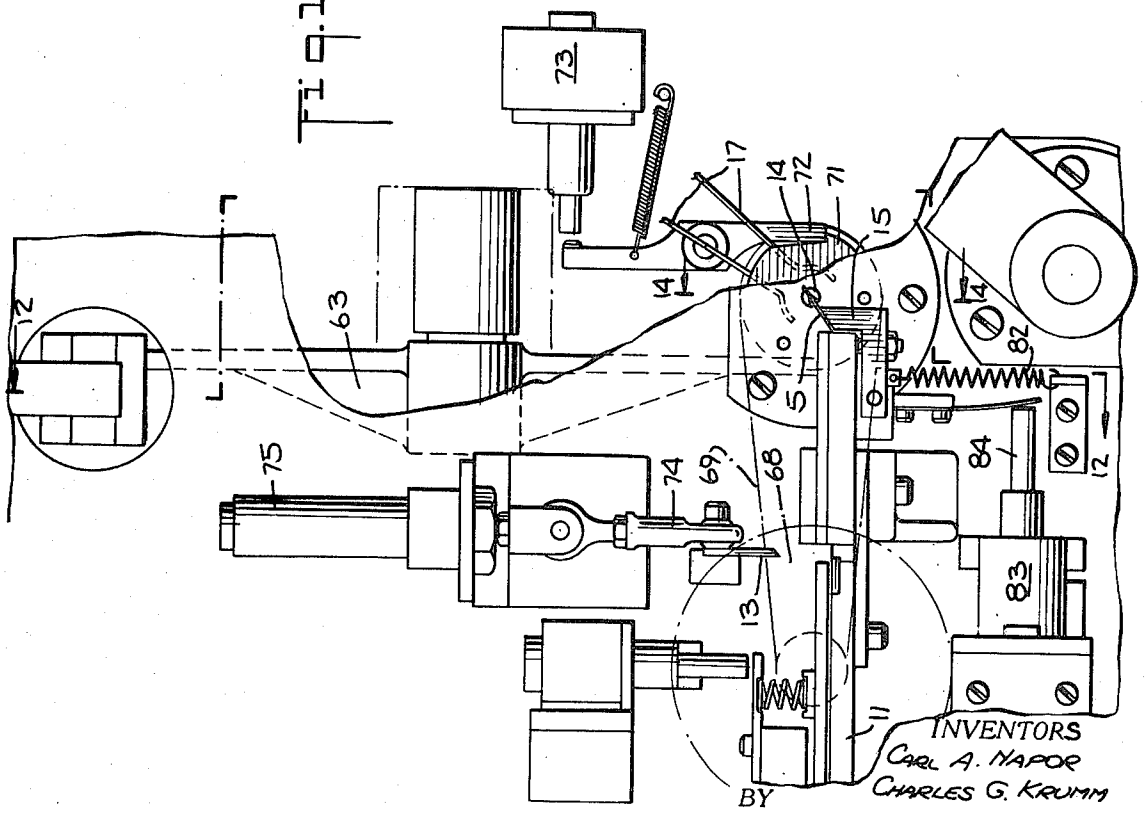


Fig. 12.

Fig. 11.



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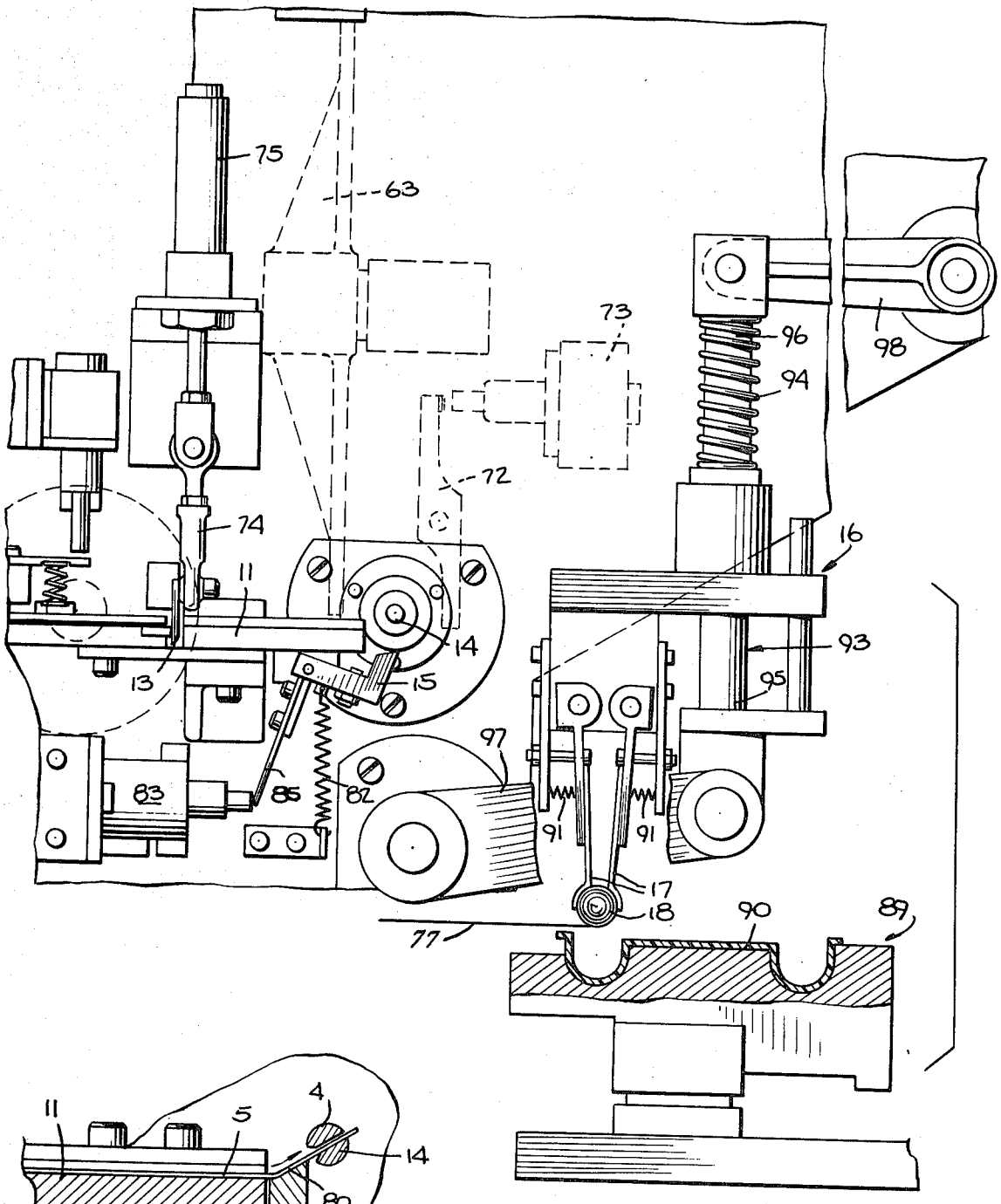

Fig. 16.

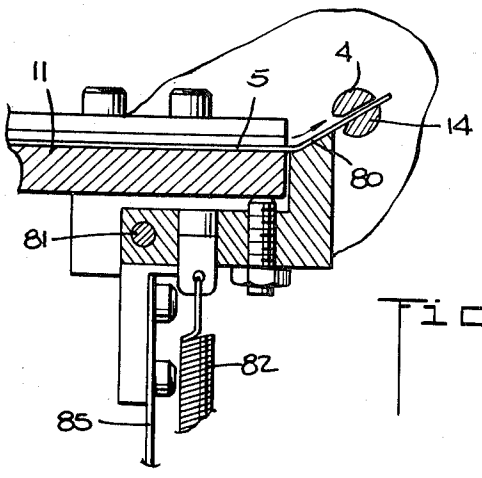

Fig. 13.

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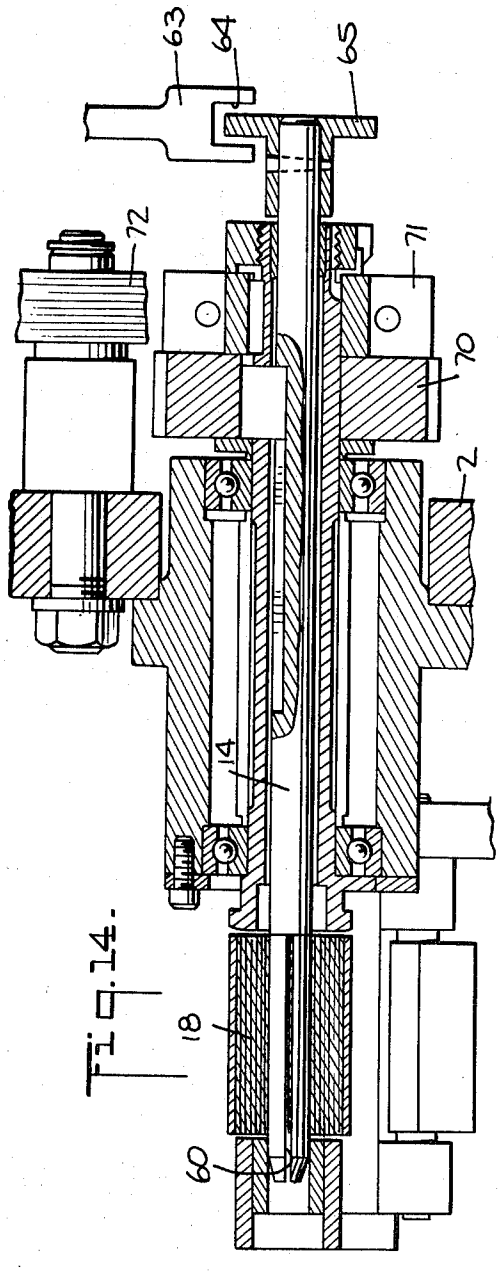

Fig. 14.

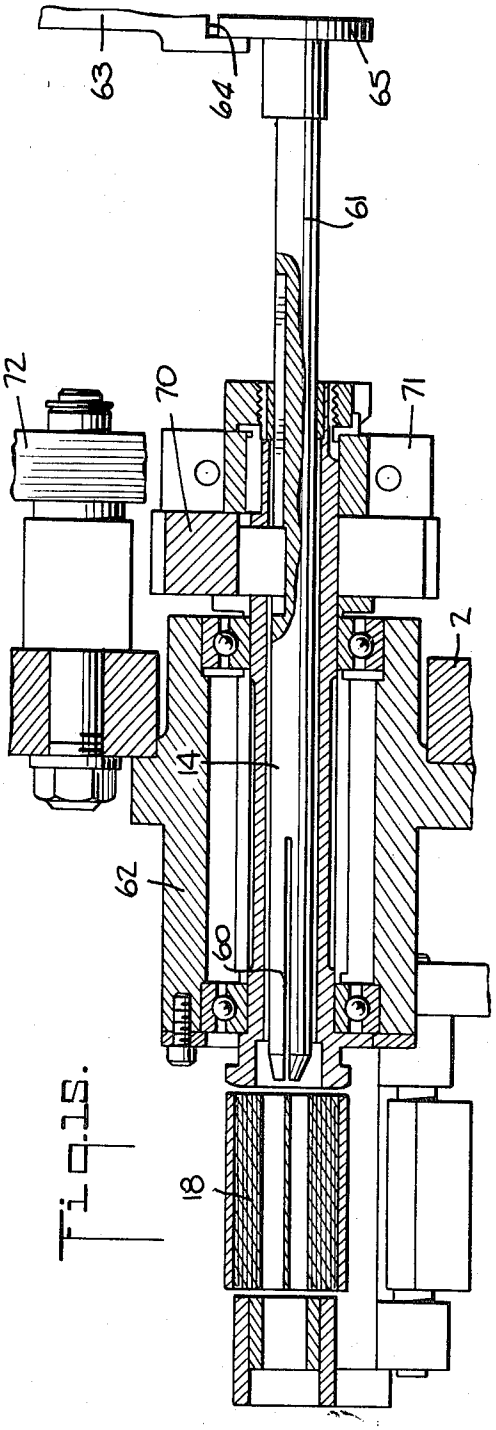

Fig. 15.

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FILM SCROLL WINDING MACHINE

BACKGROUND OF THE INVENTION

The present invention relates to a high speed automatic scroll winding machine of the type which winds a two-ply scroll comprising sensitized film and paper backing. These scrolls are widely used in magazines in automatic cameras and a principal use for the device of the invention is in winding film and paper scrolls to be fed to automatic film magazine loading equipment.

Scrolls of the general type wound on this machine are described, for example, in U.S. Pat. No. 3,138,081.

The scroll winding machine in accordance with the present invention comprises an improvement over a scroll winding machine described in Napor et al. U.S. Pat. No. 3,457,627 owned by the assignee of the present invention.

The scroll winding machine in accordance with the present invention includes a transfer means to transport the wound scrolls to a separate cartridge loading machine. The machine in accordance with the present invention may be utilized, for example, for supplying wound scrolls to an automatic film cartridge loading turret as described in the above referred to Napor et al. U.S. Pat. No. 3,457,627.

The scroll winding means in the Napor et al. patent utilizes a number of separate scroll winding tracks and arbors mounted for movement along a circular path on an indexing table and where one track on the scroll winding table is provided for each cartridge assembly station on an adjacent cartridge loading turret. The present invention replaces the large number of movable scroll winding tracks with one or two stationary track systems which are adapted for operating at high winding speeds so that they can replace the more numerous scroll winding heads on earlier machines without a decrease in the overall operating speed of the cartridge loading machine.

Accordingly, an object of the present invention is to provide an improved high speed film and paper scroll winding machine.

Another object of the present invention is to provide a stationary film and paper scroll winding machine suitable for the rapid feeding of a plurality of cartridge loading heads on an adjacent cartridge loading machine.

Another object of the present invention is to provide film and paper scroll winding machines which may be utilized in pairs permitting continuous operation of either one or the other scroll winding machine by itself.

Another object of the present invention is to provide a highly reliable and easily maintained high speed film and paper scroll winding machine.

Other and further objects of the invention will be apparent upon an understanding of the illustrative embodiment about to be described or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a perspective view of a preferred embodiment of the scroll winding machine;

FIG. 2 is a side elevational view partially cut away of the machine of FIG. 1;

FIG. 3 is an enlarged detailed perspective view of the scroll winding and scroll transfer portion of the machine;

FIGS. 4 through 7 are diagrammatic illustrations showing the sequence of operations of the principal elements of the machine;

FIG. 8 is an enlarged detailed side elevational view, partially in section, illustrating the film cutting and tape applying means of the machine;

FIG. 9 is a vertical sectional view of the film track at a photoelectric check point taken along line 9—9 on FIG. 2;

FIG. 10 is a perspective view of an unwound scroll illustrating the position of the film on the paper backing;

FIG. 11 is an enlarged detailed side elevational view of the winding arbor and adjacent portions of the machine;

FIG. 12 is a vertical sectional view taken along line 12—12 on FIG. 11;

FIG. 13 is an enlarged detailed side elevational view, partially in section, illustrating the relative positions of the deflector and winding arbor elements at the beginning of a scroll winding operation;

FIG. 14 is a vertical sectional view of the winding arbor taken along line 14—14 on FIG. 11;

FIG. 15 is a vertical sectional view of the winding arbor corresponding to FIG. 14 but showing the arbor in its withdrawn or scroll transfer position; and

FIG. 16 is an enlarged detailed side elevational view of the winding arbor and the adjacent scroll transfer means.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The scroll winding machine will now be described generally with particular reference being made to FIGS. 1 and 2 which illustrate the position of and cooperation between the principal elements of the machine and then the sequence of operation of these principal elements will be described with reference to the diagrammatic illustrations in FIGS. 4 through 7. A detailed description of the important portions of the machine will then be given under appropriate headings.

The scroll winding machine in accordance with the present invention is used to wind scrolls at relatively high speed and to transfer them to a related film magazine loading machine which might comprise an indexing turret having a series of cartridge loading stations positioned around its outer edge. One such cartridge loading machine is described, for example, in U.S. Pat. No. 3,457,627 already referred to above. While a single scroll winding machine in accordance with the present invention might be utilized for this purpose, a preferred installation utilizes two identical machines which are timed to feed completed scrolls alternately to a magazine loading machine. This double arrangement provides for a high speed winding and loading operation using both machines and also permits a lower speed continuing operation during a checking or repair or reloading of one or the other of the machines.

As illustrated in FIGS. 1 and 2, the scroll winding machine 1 comprises a generally vertical mounting panel 2 extending upwardly from a suitable base 3.

Supply rolls of sensitized film 4 and of backing paper 5 are mounted at the left hand end of the mounting panel 2 on spools 6 and 7. The backing paper 5 is fed past a paper loop feed drive wheel 8 and through a loop-shaped slack portion 9 to paper feed pressure rollers 10 to a generally horizontal paper guide track 11. As best illustrated in FIG. 2, the track 11 which contains the paper 5 extends from the feed rollers 10 past a pair of cooperating pinch rollers 12 and a paper cutter 13 to the winding arbor 14 located at the right hand side of the mounting panel 2. Just below the winding arbor 14, a paper deflector 15 is removably positioned in the paper path to direct a cut end of the paper 5 into the winding arbor 14. A scroll transfer means 16 including scroll gripping fingers 17 is mounted adjacent to the winding arbor 14 for transferring the scroll 18 (FIG. 16) to an automatic magazine loading means or other scroll handling mechanism. Several photoelectric control systems are preferably mounted along the paper path and their function will be further described below. These include a paper loop control system 20, a paper perforation counter system 21, and a paper pressure feed roll control system 22.

The film 4 from the film roll passes over suitable guide rollers 24 to a film feeding drum 25 which periodically rotates one revolution to advance the film 4 the necessary distance to provide the film strip for one scroll. The film 4 coming off of the feeding drum 25 is fed downwardly through an inclined film track 26 past a film cutting device 27 and a tape applying device 28 to a junction point between the film track 26 and the paper track 11 so that beyond this junction the film and the paper pass in overlying relationship through the pinch rollers 12 and towards the winding arbor 14.

Two photoelectric control systems are included along the path of the film track 26 including a film perforation counter 29 and a film registration check 30. The operation and cooperation of the above described elements will now be described with particular reference to diagrammatic FIGS. 4 through 7.

THE SCROLL WINDING OPERATION

The operating sequence of the above described elements is as follows. FIG. 4 shows the position of the film 4 and paper 5 after the termination of one winding cycle and at the commencement of the next cycle. At this time, the scroll transfer means 16 has returned from transferring the previously completed scroll to a carriage loading station and is in position for surrounding the winding arbor 14 for the next winding and transfer. The paper 5 extends through the machine up to the paper cutting knife 13 which had previously severed the paper for the previous scroll. The pinch rollers 12 are open and the end of the film 4 is located adjacent the film cutter 27 where it has remained since the cutting of the previous film strip. At the commencement of the scroll winding operation, the arbor 14 has been moved back within the arms 17 of the transfer means 16 and the paper deflector 15 has been moved upwardly adjacent to the returned arbor 14.

The paper feed rollers 10 (FIG. 5) are now driven to advance the paper over the deflector 15 and into the arbor 14 slot until photoelectric system 22 detects the first paper hole 34 (FIG. 10) to end roller 10 drive. Simultaneously, the film feed drum 25 is started to advance the film strip 4 downwardly to place its forward end between the open pinch rollers 12 as illustrated in FIG. 5. The length of the film 4 advance is controlled by rotating the film feed drum 25 exactly one revolution and by properly proportioning its circumference to provide for the necessary film length advance. When the film feed drum 25 has completed one revolution it stops and simultaneously actuates the film and tape cutter 27 and the tape applier 28. The film cutter mechanism 27 simultaneously cuts the film 4 and an end piece 32 off of the film attaching tape 31. The end piece 32 of the tape is pressed against and attached to the rear end of the severed film strip 33.

Pinch rollers 12 (FIG. 6) are now brought together pinching the film strip 33 and the paper 5 together and the arbor 14 is rotated to perform a simultaneous advance and winding of the paper 5 and the film strip 33 as the paper feed pressure rollers 10 are opened to permit a free advance of the paper 5 by the arbor 14.

Photoelectric system 21 (FIG. 7) counts perforations in the advance paper 5 and terminates the windup at the position illustrated in FIG. 7 to cut off the arbor winding and pull out the winding arbor from transfer arm 16 as the paper cutting knife 13 is moved downwardly to sever the paper 5. The scroll transfer arm 16 is now rotated in a counterclockwise direction (FIG. 7) to transfer the completed scroll 18 to a magazine loading position. In addition to the paper strip and the paper hole counting photocell systems 21 and 22 noted above, an additional photocell system is employed at 29 to double check the correct film length advance by counting the film holes 35 (FIG. 10). An additional photocell system is employed at 30 to check for proper film strip 33 positioning after the advance by registering with a correctly positioned aperture in the advanced film.

A still further photocell system 20 is employed across a looped portion of the paper strip to restore the loop each time when it is depleted to the point where this system is unobstructed by the loop. When this loop 9 raises above the photocell system beam 41, the system 20 runs paper 5 drive 8 for a predetermined period to restore the loop 9.

THE FILM CUTTING AND TAPE APPLYING MEANS

As already described, the strip of film 4 which is to be rolled into the final scroll 18 is fed from the film roll by the feed drum 25 down an inclined film track 26 and is cut to the proper length and provided with a connecting piece of tape 32 during this operation. The details of the film cutter and tape applier are illustrated in FIG. 8.

During the rolling operation by the winding arbor 14 for the preceding film scroll 18, the film feeding drum 25 is rotated one revolution to advance another strip of film 33 down the film track 26 to the point where its leading end moves under the pinch rollers 12. At the termination of the feeding of this length 33 of film 4, its trailing end is cut and a piece of pressure sensitive tape 32 is applied thereto so that the film strip 33 is connected to the paper 5 during the subsequent winding portion as the tape 32 passes between the pinch rollers 12.

As seen in FIG. 8, the film 4 is cut by a downward movement of the film cutting knife causing the leading edge of the aperture 50 in the knife 27 to cut the film 4 against the edge of the stationary member 51. The cutting knife now is driven upwardly causing its rear upper edge 52 to cut a piece of tape 32 from the leading end of the film tape supply 31. A resiliently mounted foot 53 holds the tape 31 against the knife 27 during the cutting. A subsequent downward movement of the tape applying member 28 carries the tape end 32 against the end of cut film 33 thereby attaching the leading edge of the tape 32 to the trailing edge of the film strip 33 in the manner illustrated in dash-dot lines in FIG. 8. The pressure sensitive tape 31 supplied from the tape spool 54 around a drive roller 55 is now advanced a short distance to prepare for the next cutting operation. The cutter 27, the tape applying member 28, and the drive roller 55 are moved at the appropriate time by being coupled to rotating cams 56, 57 and 58 (FIG. 2) on a main cam shaft 59 through the intermediation of vertical coupling rods 60, 61 and 62 connecting between the cam shaft and suitable crank arms. Shaft 59 is driven one turn for each scroll 18 winding cycle.

THE SCROLL WINDING ARBOR

As described above, the winding arbor 14 includes a paper receiving slot 60 as illustrated in FIGS. 14 and 15. The end of the paper 5 is driven into the slot 60 by the paper feed pressure rollers 10 at the beginning of a winding cycle as the paper deflector 15 is moved into position to direct the paper 5 into the slot 60. The winding arbor 14 is seen to have a rearwardly extending drive shaft portion 61 rotatably mounted in a suitable bearing 62 on the mounting panel 2 for rotation during the winding and for axial movement from its winding position as illustrated in FIG. 14 to its transfer position where it is clear of the scroll as illustrated in FIG. 15.

The axial movement of the arbor 14 out of the scroll 18 after the winding and back to the winding position prior to the scroll winding operation is controlled by a crank 63 as shown in FIG. 12. The crank 63 is seen to have an end slot 64 rotatably engaging an end wheel 65 on the arbor 14 and having its other end coupled to a piston 66 of an air cylinder 67 controlled by a suitable cam on cam shaft 59. It is seen that the slot 60 in the winding arbor 14 must be positioned to receive the end of the paper 5 prior to the winding operation. The arbor 14 is turned to this position by energizing its winding motor 68 (FIG. 11) and by causing rotation of the winding arbor by belt 69 and pulley 70 to be stopped by a locking ratchet wheel and pawl 71,72 which stalls the winding motor 68 thereby holding the arbor 14 in place until the pawl 72 is removed at the commencement of the scroll winding operation. The pawl 72 is shown in FIG. 12 with its lower end engaging a positioning tooth on the one-tooth ratchet wheel 71 mounted on the arbor shaft 14. An electric solenoid 73, as illustrated in FIG. 11, rocks the pawl 72 clear of the ratchet wheel 71 at the beginning of the winding operation.

THE PAPER CUTTING MECHANISM

At the termination of the scroll winding operation, the paper 5 is cut at the proper length to leave a paper lead 77 extending from the wound scroll 18 as illustrated in FIG. 16. The paper 5 is cut by the cutting knife 13 pivotally attached at 78 to the mounting panel 2 (FIG. 3) and which is moved to and from its cutting position through the intermediation of a link 74 coupled to an air motor 75 (FIGS. 3 and 11). As already indicated, the electrical control valve 76 for the paper cutting motor 75 is operated by the paper perforation counting photocell system 21.

PAPER DEFLECTOR

An important portion of the winding operation is the initial step of inserting the cut end of the paper strip 5 into the paper anchoring slot 60 in the film winding arbor 14. The entry of the paper 5 is facilitated through the use of the movable paper deflector 15 which is best illustrated in FIGS. 11 and 13. This deflector 15, as described above, is temporarily moved into an arbor threading position at the end of track 11 prior to the winding operation as illustrated in FIG. 13.

In this position, the inclined upper surface 80 of the deflector 15 directs the advancing paper 5 directly into the slot 60 in the arbor 14 which has been moved to its winding position. The deflector 15 is seen to be pivotally mounted at 81 on the end of the paper and film track 11 permitting it to be swung from the threading position shown in FIG. 13 to its retracted position as shown in FIG. 16. A coil spring 82 urges the deflector 15 towards its retracted position and an air motor 83 (FIG. 11) including a plunger 84 engages a downwardly projecting spring finger 85 on the deflector 15 to swing it to its threading position under the control of the same signal which moves the arbor 14 axially into its winding position.

THE SCROLL TRANSFER MEANS

When the winding arbor 14 has completed the winding of the scroll 18, in a form as illustrated at 18 in FIG. 16, the scroll 18 is transferred from the winding position to another machine 89 for loading a magazine 90 with the scroll 18 or for otherwise utilizing the scroll 18. The transfer is made possible by withdrawal of the winding arbor 14 under the control of the winding arbor removal crank 63 described above. The wound scroll 18 is now lightly gripped between the spaced clamping fingers 17 of the scroll transfer means 16, which are held against the wound scroll 18 through the intermediation of spaced pressure springs 91 (FIGS. 3 and 16). These two fingers 17 are pivotally mounted on a transfer frame 92 which is slidably mounted on a transfer rod 93 under the force of a compressed coil spring 94. The rod 93 has its opposite ends 95 and 96 attached to support cranks 97 and 98 so that the path of movement of the supported scroll 18 is determined by the powered rotation of the lower crank 97 and the resultant rocking movement of the freely mounted upper crank 98.

The lower crank 97 is driven by the drive system illustrated at the lower right hand corner of FIG. 1 including a motor powered right angle speed reduction system 99 turning an output crank 100 which is coupled by the link 101 and crank arm 102 to a horizontal drive shaft 103 for the crank 97. The drive motor 104 is under the control of the paper perforation counter photocell system 21 and the transfer is made after the arbor 14 is withdrawn and the peper 5 is cut.

THE CONTROL CAMS AND MACHINE TIMING

As indicated above, an elongated cam shaft **59** is mounted in the machine base **3**. This cam shaft **59** is driven by a suitable synchronous motor to make one revolution for each winding cycle and it is also synchronized with the related machinery which is utilizing the spools wound on the winding machine **1**. The various electric or air motors described above have their control start and stop relays or other control valves operated by suitable microswitches or other switches operated by cams on the cam shaft **59**, such as the control cam **105** operating a control switch **106**. In addition to the electric and air motors controlled by the cam shaft **59**, several of the other timing functions and control have photoelectric systems as described above. These timing functions are the particularly critical ones such as the paper feed to the winding arbor under the control of the photoelectric system **22** and the termination of the scroll winding by the arbor under the control of photoelectric system **21**. The arbor winding, for example, is critical since it must be terminated at exactly the right point to provide for subsequent film registration where the scrolls are being used in film magazines. The length of the film strip **33** and the registration of its holes as controlled by photoelectric systems **29** and **30** is also an important measurement and these two systems have their outputs coupled either to warning signals or to machine power cut-off relays to either give a warning or to stop the machine in the event registration is not obtained. As also described above, certain of the functions may be controlled using direct mechanical couplings between the rotating cam shaft **59** and the moving members such as the film cutter **27** and the tape applying means **28** and the tape drive roller **55** as more fully described above.

It will be seen that an improved high speed scroll winding machine has been described which provides for a reliable and continuous feeding of wound scrolls to a magazine loading machine or other devices. In particular, the improved machine provides an effective scroll winding operation using a relatively simple and reliable winding structure adapted for simplified adjustment and maintenance and for use with differing sizes of scrolls.

The principal portions of the machine including the film and paper winding tracks and other element have stationary mountings to facilitate the above objectives and the operating cycle of the machine provides for a high capacity output from this improved and simplified structure.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, we claim:

1. Apparatus for winding a scroll of an interwound film strip and a longer backing strip comprising the combination of:

a fixed support;

means for supporting a roll of film on said support;

means for supporting a roll of backing material on said support;

a scroll winding arbor rotatably mounted on said support;

a first stationary track mounted on said support for directing the backing material from the roll of backing material to said arbor;

a second stationary track mounted on said support and intersecting said first track in advance of said arbor for directing film from the film roll into said first track overlying said backing material;

means for advancing the film a predetermined distance on said second track;

means on said second track for cutting the film to form a film strip prior to winding the scroll;

means on said first track for cutting said backing material to form a strip after the winding of the scroll;

means on said first track for pressing the film and backing material together; and

means for rotating said arbor for simultaneously winding the overlying film and backing material into a scroll and for advancing the backing material.

2. The apparatus as claimed in claim **1** which further comprises means intermediate said roll of backing material and said first track for maintaining a loop of backing material.

3. The apparatus as claimed in claim **2** in which said loop maintaining means comprises a drive roller controlled by a photoelectric device.

4. The apparatus as claimed in claim **1** in which said means for advancing said film comprises a film drive wheel, and means for turning the wheel intermittently through one revolution.

5. The apparatus as claimed in claim **1** which further comprises a deflector positioned at said winding arbor for directing the backing material into the scroll winding arbor, and means for moving the deflector into and out of the path of the backing material.

6. The apparatus as claimed in claim **1** which further comprises scroll transfer means for removing the wound scroll from the apparatus, and means for moving said winding arbor out of the path of said transfer means.

7. The apparatus as claimed in claim **1** which further comprises means for applying pressure sensitive tape to the trailing ends of the film strips.

8. The apparatus as claimed in claim **7** in which said tape applying means comprises a roll of pressure sensitive tape, tape advancing means, and tape cutting means.

9. The apparatus as claimed in claim **8** in which said tape cutting means is operatively coupled to said film cutting means.

10. Apparatus for winding a scroll of an interwound perforated film strip and a longer perforated backing strip with the perforations on one strip having a predetermined position in the wound scroll to perforations in the other strip comprising the combination of:

a fixed support;

means for supporting a roll of perforated film on said support;

means for supporting a roll of perforated backing material on said support;

a scroll winding arbor rotatably mounted on said support;

a first stationary track mounted on said support for directing the backing material from the roll of backing material to said arbor;

a second stationary track mounted on said support and intersecting said first track in advance of said arbor for directing film from the film roll into said first track overlying said backing material;

means for advancing the film a predetermined distance on said second track;

means on said second track for cutting the film to form a film strip prior to winding the scroll;

means on said first track for cutting said backing material to form a strip after the winding of the scroll;

means on said first track for pressing the film and backing material together;

means for rotating said arbor for simultaneously winding the overlying film and backing material and for advancing the backing material; and

means for removing the wound scroll from said apparatus.

11. The apparatus as claimed in claim **10** which further comprises checking means on said second track for counting film perforations.

12. The apparatus as claimed in claim **10** which further comprises control means on said first track for counting perforations in said backing material.

13. The apparatus as claimed in claim **10** which further comprises means intermediate said roll of backing material and said first track for maintaining a loop of backing material.

14. The apparatus as claimed in claim **13** in which said loop maintaining means comprises a drive roller controlled by a photoelectric device.

15. The apparatus as claimed in claim **10** in which said means for advancing said film comprises a film drive wheel, and means for turning the wheel intermittently through one revolution.

16. The apparatus as claimed in claim **10** which further comprises a deflector positioned at said winding arbor for directing the backing material into the scroll winding arbor, and means for moving the deflector into and out of the path of the backing material.

17. The apparatus as claimed in claim **10** which further comprises scroll transfer means for removing the wound scroll from the apparatus, and means for moving said winding arbor out of the path of said transfer means.

18. The apparatus as claimed in claim **10** which further comprises means for applying pressure sensitive tape to the trailing ends of the film strips.

19. The apparatus as claimed in claim **18** in which said tape applying means comprises a roll of pressure sensitive tape, tape advancing means, and tape cutting means.

20. The apparatus as claimed in claim **19** in which said tape cutting means is operatively coupled to said film cutting means.

21. Apparatus for winding a scroll of an interwound perforated film strip and a longer perforated backing strip with the perforations on one strip having a predetermined position in the wound scroll to perforations in the other strip comprising the combination of:

a fixed support;

means for supporting a roll of perforated film on said support;

means for supporting a roll of perforated backing material on said support;

a scroll winding arbor rotatably mounted on said support;

a first stationary track mounted on said support for directing the backing material from the roll of backing material to said arbor;

a second stationary track mounted on said support and intersecting said first track in advance of said arbor for directing film from the film roll into said first track overlying said backing material;

means for advancing the film a predetermined distance on said second track;

means on said second track for cutting the film to form a film strip prior to winding the scroll;

means on said first track for cutting said backing material to form a strip after the winding of the scroll;

means on said first track for pressing the film and backing material together;

roller means on said first track for advancing the backing material to said arbor;

photoelectric means for controlling said backing material roller means;

means for rotating said arbor for simultaneously winding the overlying film and backing material and for advancing the backing material; and

means for removing the wound scroll from said apparatus.

22. The apparatus as claimed in claim **21** which further comprises checking means on said second track for counting film perforations.

23. The apparatus as claimed in claim **21** which further comprises control means on said first track for counting perforations in said backing material.

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