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2,647,034

SHEET WRAPPER MECHANISM FOR FACSIMILE MACHINES

Filed Aug. 25, 1950

5 Sheets-Sheet 1

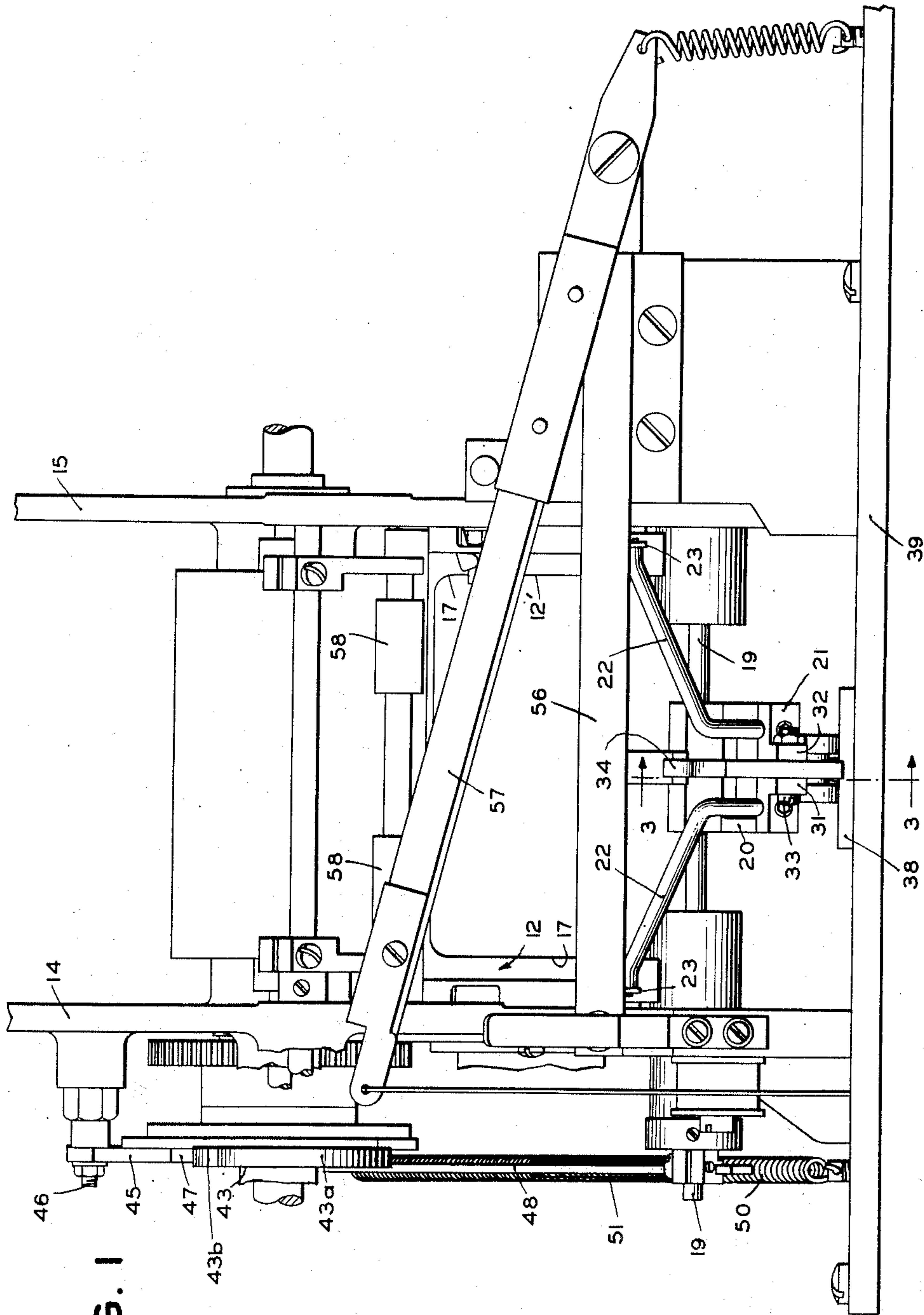


FIG. 1

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5 Sheets-Sheet 2

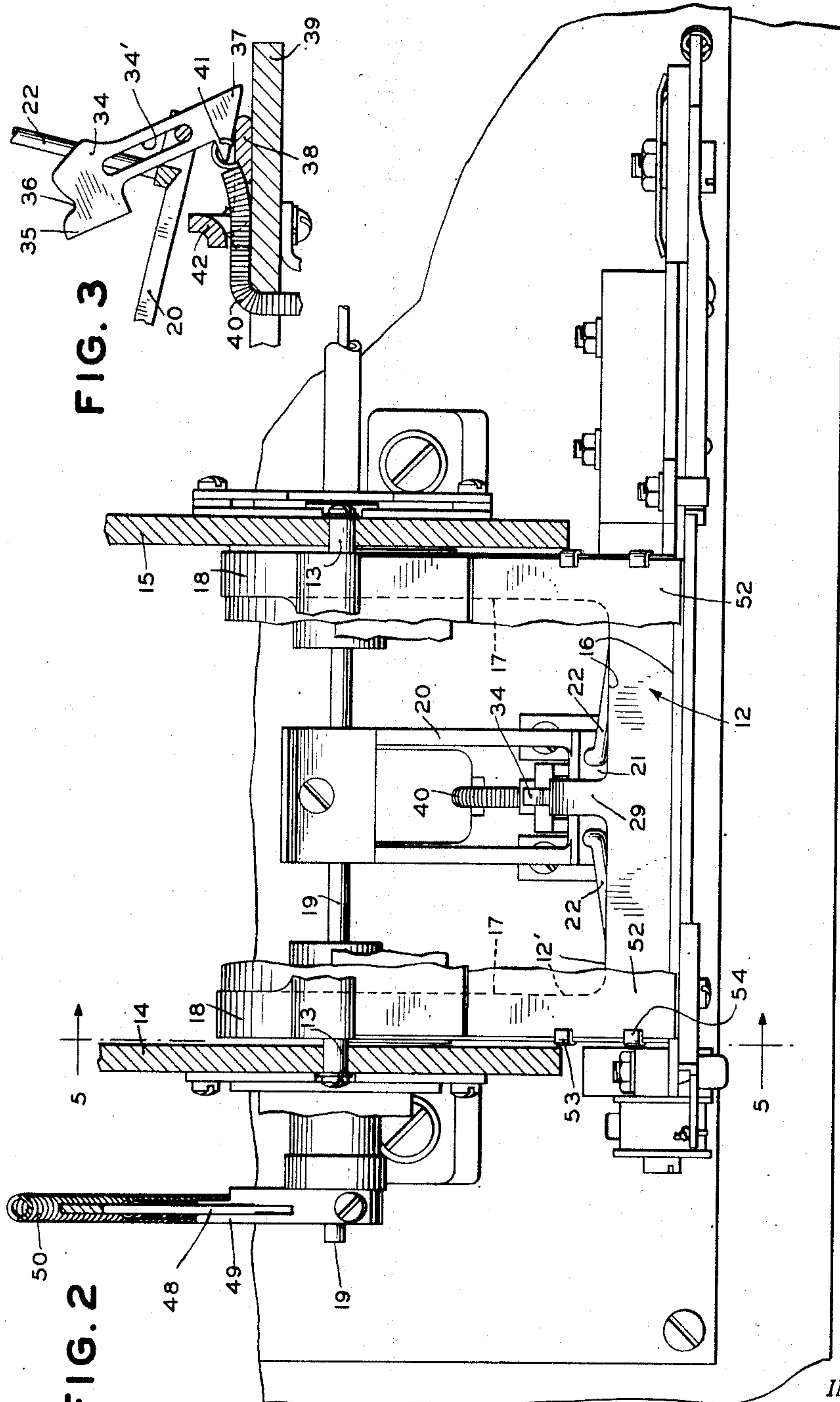


FIG. 2

FIG. 3

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FIG. 7

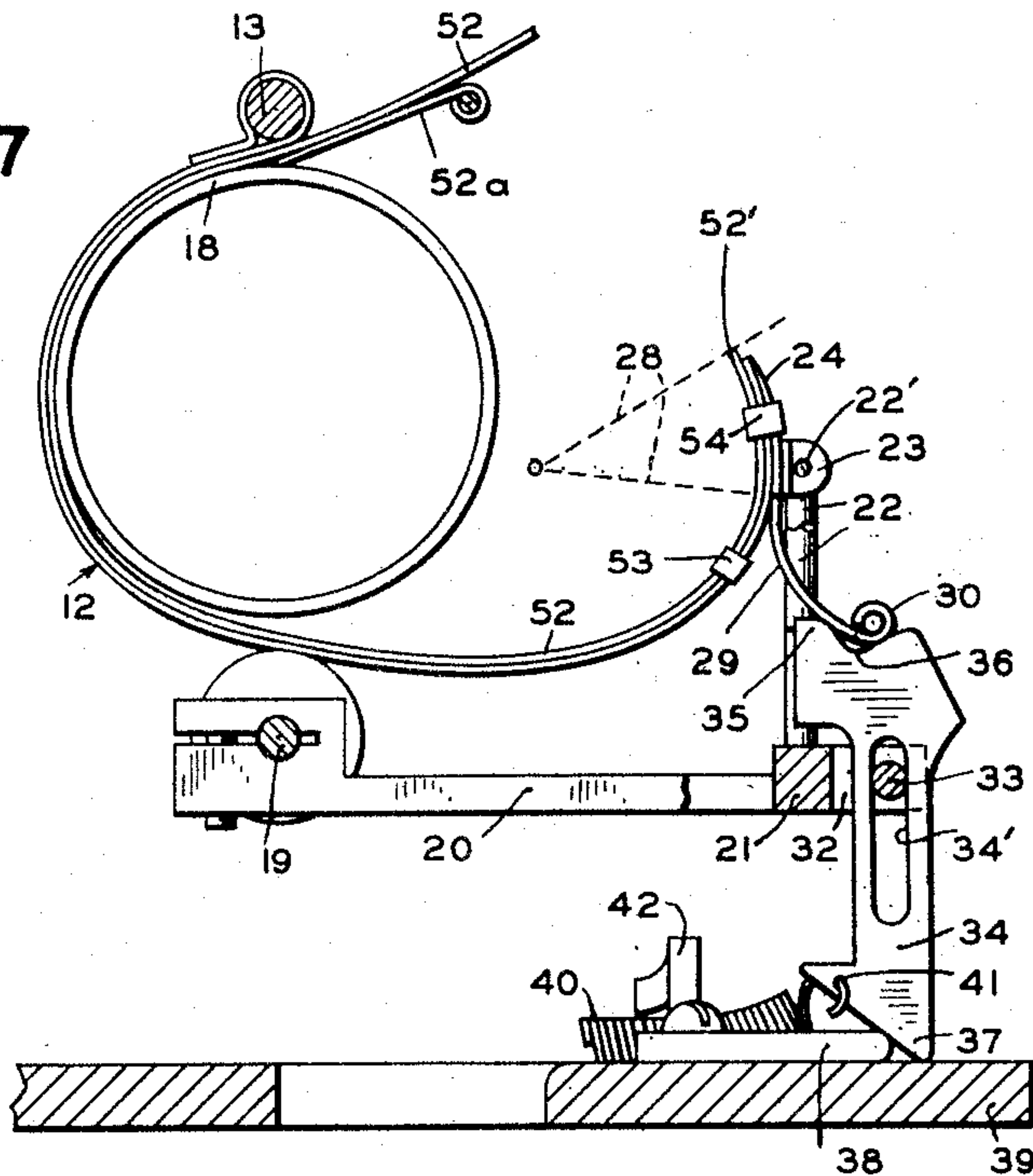


FIG. 8

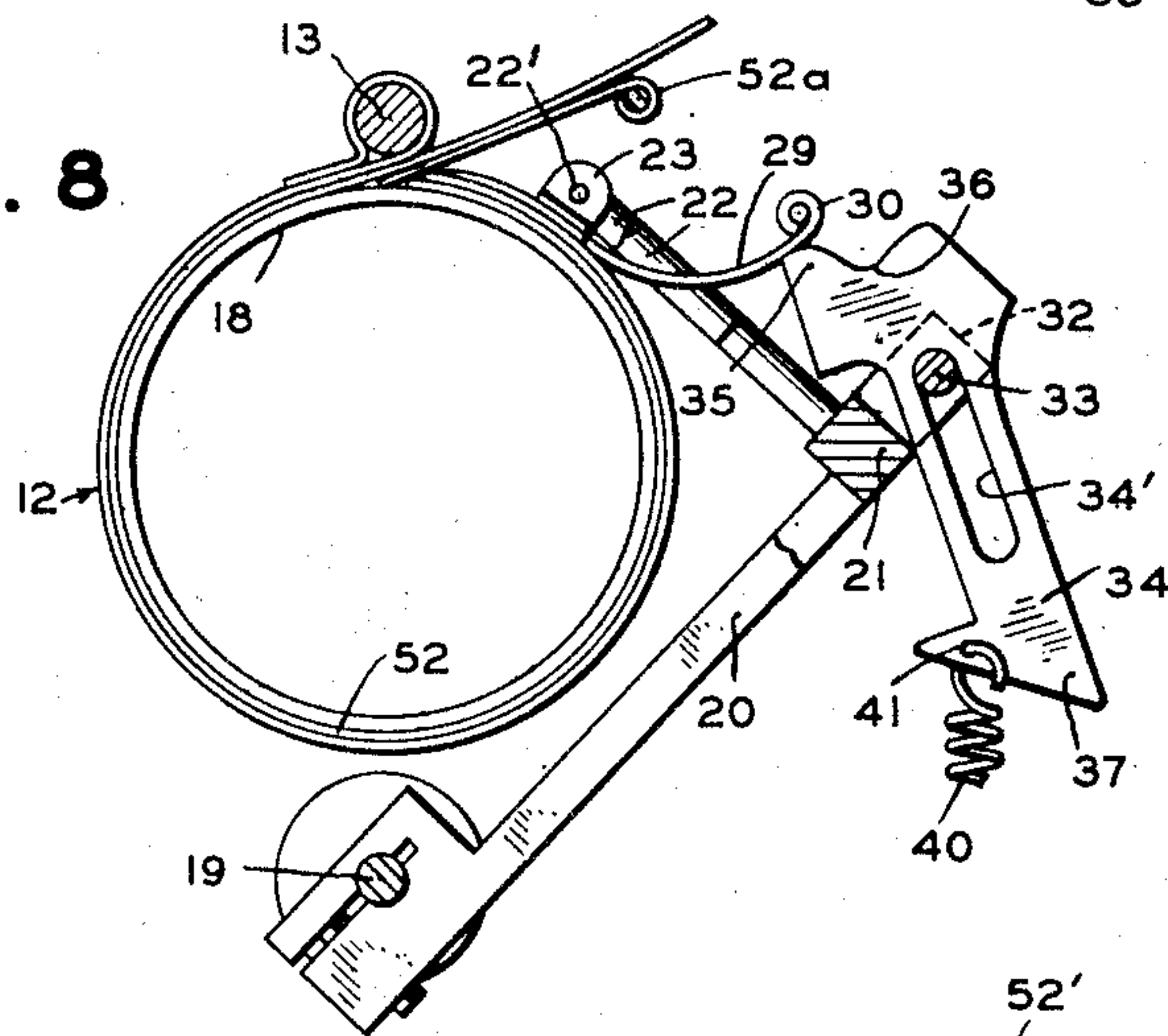
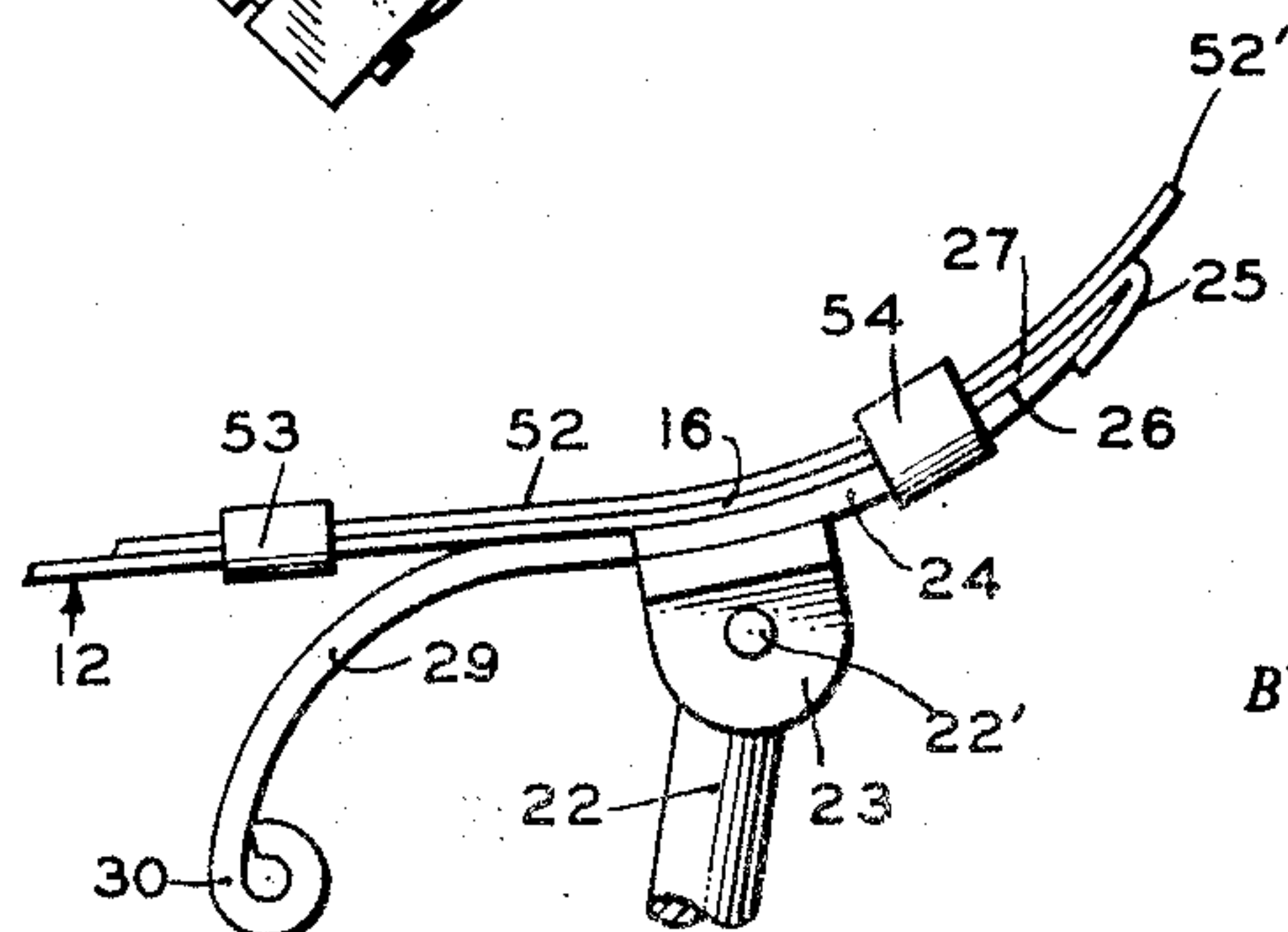


FIG. 9



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SHEET WRAPPER MECHANISM FOR
FACSIMILE MACHINESCharles Jelinek, Jr., Verona, N. J., assignor to The
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Application August 25, 1950, Serial No. 181,375

8 Claims. (Cl. 346—138)

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My invention relates to facsimile machines of the type in which a cylindrical sheet of paper is supported for inside scanning by a rotary stylus or an optical ray, and the principal object of this invention is to provide improved means for shaping a length of paper drawn from a continuous roll into a complete hollow cylinder in which the inner surface is left free for scanning.

The sheet supporting mechanism of this invention includes a flexible sheet-folding wrapper like that disclosed in Wise Patent No. 2,511,892, issued June 20, 1950, and I have devised improved apparatus for bending the wrapper and the enclosed sheet into a perfect cylinder which is firmly held in that shape during a scanning operation.

Considered from the standpoint of its present commercial use, my invention comprises novel wrapper operating connections designed to eliminate the cord employed in the wrapper mechanism of the facsimile recorder shown in the pending Hallden et al. application, Ser. No. 6,846, filed February 7, 1948. In that case the tip of the flexible wrapper was rocked or tilted into final closing position by means of a cord supported on pulleys and operated by a solenoid. It was found in actual practice that this cord and solenoid arrangement could not always be depended upon to complete the perfect closing of the wrapper at the same critical instant. That was due to several factors, such as the length of the cord changing with use and with weather conditions, and the slight time variations in the operation of the solenoid.

To overcome the foregoing difficulties incident to the use of a filar element in the wrapper operating connections, I have devised a mechanism which includes a rigid member for curling up the free edge or lip of the flexible wrapper soon after it starts to close. This rigid member is in the form of a link or latch so connected to the end of a pivoted lever as to bring the curved lip of the wrapper into proper position for the final closing movement thereof by the operating lever. This novel wrapper operating mechanism is made up entirely of rigid parts which are dependable in their critical operation under all conditions. Further, this mechanism is controlled by a cam through connections which are wholly mechanical and therefore positive. By doing away with the cord and solenoid of the Hallden et al. machine referred to, I have produced a simple reliable wrapper operating device which has been found to be satisfactory in actual use.

The practical advantages of my invention will

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be fully understood from a description of the accompanying drawings, in which:

Fig. 1 is a front view of a facsimile recorder equipped with my new wrapper mechanism;

Fig. 2 shows a top view of the machine;

Fig. 3 is a section on line 3—3 of Fig. 1;

Fig. 4 is a left end view of the machine;

Fig. 5 shows a section on line 5—5 of Fig. 2, slightly enlarged for clearness, with the various parts in normal open position;

Fig. 6 is a view similar to Fig. 5, with the wrapper mechanism in fully closed position;

Fig. 7 shows the wrapper operating connections in midway position;

Fig. 8 is like Fig. 6 but simplified and enlarged to show the closed position of the wrapper mechanism by itself; and

Fig. 9 is a magnified view of the wrapper element at its free end or lip.

Since the machine shown in the drawings is like the one set forth in the Hallden et al. application mentioned, I need describe only such parts as are necessary to understand the construction and operation of my novel wrapper mechanism.

The flexible wrapper element that shapes the paper into a cylinder is a thin metal sheet 12 (usually of Phosphor bronze) pivoted at its rear end on a horizontal rod 13 which is supported by a pair of upright plates 14 and 15. The sheet 12, which is rectangular when flat, is preferably cut away in the middle, as indicated at 12' in Figs. 1 and 2, in order to increase its flexibility. The cut-away portion thus leaves a front edge 16 and two side strips 17 which are arranged to fold over a pair of fixed circular flanges 18 mounted in axial alignment on the plates 14 and 15.

A rockshaft 19 is journaled in the plates 14—15 below the cylindrical flanges 18 in vertical alignment with the wrapper supporting rod 13. A lever 20 is fixed on shaft 19 in central position with respect to the wrapper 12, as shown in Fig. 2. The lever 20 is preferably in the form of a rectangular frame or casting with a front cross-bar 21 to which are fastened two divergent arms 22 extending upward into pivotal engagement with a pair of lugs or ears 23 secured to the underside of a lip 24 (best shown in Fig. 9). The aligned upper ends of the arms 22 are in effect pivot pins 22' for the ears 23. The rigidly connected parts 20 and 22 constitute a right-angled lever pivoted on the axis 19 and pivotally connected along the axis 22' to the wrapper 12.

The lip 24 is a reinforcing strip of metal (such as hard brass) attached to the underside of the front edge 16 of the wrapper sheet 12. As seen

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in Fig. 9, the lip 24 tapers toward its outer edge and the end 25 of the wrapper 12 is bent around the edge of the lip. In practice the parts 12 and 24 are sweated together over their entire contact area, so that the lip 24 is in effect an integral rigid part of the flexible wrapper sheet 12, which is thereby strengthened to allow mounting of the ears 23 which receive the connecting arms 22.

The inner transverse curvature 26 of lip 24 (and therefore the curvature 27 of the attached portion of wrapper 12) is substantially identical with the curvature of the circular flanges 18, as indicated by the imaginary arc 28 in Fig. 7. In other works, the flexible wrapper 12 terminates at its free end in a rigid lip of the required cylindrical curvature which may be on a slightly smaller (but never on a greater) radius than the curvature of the flanges 18.

The lip 24 has a central tailpiece 29 which extends rearward and curves away from the wrapper 12. The tailpiece 29 is preferably an integral extension of the lip 24 and terminates in a rounded end 30. The cross-bar 21 of lever 20 has a pair of spaced lugs 31—32 which carry a pin 33 arranged to pass through a slotted bar 34 which I call a latch. The main function of this latch, which constitutes the principal novel element of this wrapper operating mechanism, is to swing the curved rigid lip 24 of the flexible wrapper 12 upward into a preliminary curled up position (Fig. 7) from which the lever 20 carries it into final closing position (Fig. 8). This will be clear from the following explanation.

The head of latch 34 is formed as a cam edge with a tip 35 and a curved recess 36, which constitutes a track for the tailpiece 29. The lower end 37 of the latch is bevelled and normally held against a fixed stop 38 on a base plate 39. A contracting coil spring 40 is attached to the latch tip 37 at 41 and this spring passes down through the base of the machine. The lower end of the spring is fastened at any convenient point (as at 41' in Fig. 5). A rounded guide piece 42 (Fig. 3) holds the spring 40 in place during the up and down movements of latch 34.

The operating connections for the rockshaft 19 on which the lever 20 is secured are shown in Fig. 4 and are substantially the same as those disclosed in the Hallden et al. application, so that they require but a brief description here. A cam 43 mounted on a motor driven shaft 44 controls a lever or follower 45 pivoted at 46 and having a projection 47 held in constant engagement with the edge of cam 43. A link 48 is pivoted at its upper end to lever 45 and the lower end of the link has a pin-and-slot connection 48' with an arm 49 fixed on the end of rockshaft 19. A strong contractile spring 50 is connected to link 48 and a weaker spring 51 connects the arm 49 to the link.

When the follower 45 rides over the high circular edge 43a of cam 43, the spring 51 holds the lever 20 in its lowest position, as shown in Fig. 5. This is the fully open position of the wrapper operating connections. When the follower 45 rides over the lower edge 43b of cam 43, the spring 50 pulls the link 48 down and rocks the shaft 19 counterclockwise, thereby swinging the lever 20 upward into wrapper closing position, as illustrated in Fig. 6. Any other suitable connections may be employed to operate the rockshaft 19 for opening and closing the wrapper 12 at the proper moments.

Let us now see how the movements of the lever 20 control the operation of the latch 34. It is

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to be assumed that, while the wrapper 12 is open, a sheet of recording paper 52 is fed from a supply roll (not shown) over a hinged guide plate 52a into the wrapper. The sides of the paper pass through small channel lugs 53 and 54 secured to the wrapper 12 and the lip 24, respectively. In the drawings, the paper sheet 52 is shown as lying in contact with the entire surface of the wrapper. However, in actual practice, since there is necessarily a little play between the paper and the channeled guide pieces 53—54, the sheet may lie slightly clear of the wrapper at the lip. The free edge 52' of the inserted sheet always extends a little out of the wrapper tip.

With the wrapper mechanism in normal open position, as shown in Fig. 5, the cross-pin 33 at the outer end of lever 20 is held on the bottom of the longitudinal slot 34' of latch 34 by the tension of spring 51. At the same time the downward pressure on the head of latch 34 by the tailpiece 29 of lip 24 holds the latch tipped rearward, with the bevelled lower tip of the latch resting against the stop 38. It should be noted that the top recess 36 of latch 34 acts as an abutment for the tailpiece 29, so that the lip of the wrapper is held substantially horizontal for the easy forward movement of the paper out of the wrapper after a recording operation.

Assume now that the wrapper mechanism is being closed by the upward movement of lever 20. For the first few degrees of upward travel from its normal position in Fig. 5, the lever 20 swings to a position similar to that shown in Fig. 7 and rocks the latch 34 into vertical position. During this initial upward swing of the lever 20, the rocking movement of latch 34 curls up the front portion of the wrapper from its flat wide open position in Fig. 5 to the partly closed position in Fig. 7. This is accomplished by the cam edge 36 of the latch engaging the tailpiece 29 and thus rocking the front portion of the wrapper rearward about the pivot axis 22'. The practical advantages of this preliminary curling-up or crimping of the wrapper will be presently explained.

As the lever 20 continues its upward swing, the latch 34 is carried along by the pin 33 and is tilted rearward. The connecting point 41 of spring 40 has now moved to the right of pin 33, so that the downward pull of the spring tends to rock the tilted latch 34 clockwise. During this upward tilting movement of the latch, the tailpiece 29 rides over the tip 35 of the latch, which thus exerts an upward pressure against the tailpiece. As a result, the curved lip 24 of the wrapper can be pressed firmly over the cylindrical flanges 18 and the paper 52 in the wrapper is shaped into a perfect cylinder for inside scanning by a rotary stylus 55. The smooth under surface of the hinged metal plate 52a guides the projecting tip 52' of the sheet safely into place. Since the scanning mechanism of this machine does not belong to my invention, I need not describe any part thereof.

The preliminary curling up of the front portion of the wrapper by the latch 34, as shown in Fig. 7, is necessary to prevent the paper from sliding out too far beyond the lip of the wrapper. As previously mentioned, the sheet 52 in the wrapper is only in loose contact therewith, and if the wrapper were moved up in its open condition, as shown in Fig. 5, the paper would slide out so far that the extended edge would fold over when it hit the guide plate 52a. This folded edge would prevent proper feed-out of the paper

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between the knife edges when the wrapper opened. Besides, in the machine as now constructed, such unduly extended edge or tip of the paper would hit the feed out rollers 53, Fig. 1, which must be placed as close to the wrapper support 13 as possible.

This danger of the paper sliding out too far during the closing of the wrapper is completely averted by the curling or crimping action of the latch 34. With the wrapper curled up as shown in Fig. 7, the enclosed tensioned paper 52 is pressed against the wrapper sufficiently to be held against creeping or slipping out and it remains that way while the lever moves the wrapper into final closed position in Fig. 8.

After a recording operation the closed wrapper is automatically opened and the recorded length of paper is fed out of the open wrapper over a stationary knife bar 56. A pivoted knife blade 57 is then automatically operated to cut off the projected sheet. No further description of the construction and operation of this cutting device is necessary because it is not a part of my invention, being fully disclosed in the aforesaid Hall-den et al. application. I mention this cutting operation in connection with the wrapper mechanism to point out that, when the wrapper is open, the end of tailpiece 29 engages the recess 36 of the tilted latch 34 to hold the lip 24 tilted forward against the knife bar 56.

It will be seen that the connections for operating the wrapper mechanism from the central cam 43 are entirely mechanical, consisting of a few sturdy parts, dependable in their respective functions. The latch 34 makes it possible for the lever 20 not only to wind the wrapper 12 around the cylindrical flanges 18 but also to tilt the curved rigid lip 24 into proper closing position. When I refer to the lip 24 as rigid, both in the description and claims, I mean that it is sufficiently stiff to strengthen the edge portion of the thin wrapper sheet 12 for connecting the operating mechanism thereto. Further, when I say that the paper is formed into a perfect or complete cylinder by means of the wrapper lip 24, I mean a cylinder perfect for inside scanning and I disregard the slight longitudinal gap that may be left by the free tip of the paper, for no recording takes place while the stylus moves across that gap, which appears greatly exaggerated in Fig. 8.

I claim as my invention:

1. A facsimile machine having a flexible wrapper mounted at one end and adapted to receive a sheet of paper for inside scanning, a cylindrical support associated with said wrapper, a curved rigid plate secured to the outer side of the free end of said wrapper and tiltable with said free end relatively to the body of the wrapper, an actuating device connected to said wrapper for closing the same around said cylindrical support, and mechanical means controlled by said device for tilting said rigid plate relatively to the flexible portion of the wrapper adjacent thereto before the latter is closed.

2. A facsimile machine having a flexible wrapper mounted at one end and adapted to receive a sheet of paper for inside scanning, a cylindrical support associated with said wrapper, a curved rigid plate secured to the outer side of the free end of said wrapper and tiltable with said free end relatively to the body of the wrapper, and mechanism having a pivotal connection with said lip for closing the wrapper around said support, said mechanism including a pivoted

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member adapted to engage said plate in the initial closing movement thereof to curl the free end portion of the wrapper into a position which enables said mechanism to close the wrapper and sheet into a perfect cylinder.

3. A facsimile machine having a flexible wrapper mounted at one end and adapted to receive a sheet of paper for inside scanning, a cylindrical support associated with said wrapper, a curved rigid lip secured to the free end of said wrapper, a lever pivotally connected to said lip, means for operating said lever to close the wrapper, and means actuated by said lever to rock said curved lip into a position which enables said lever to carry the lip against said cylindrical support, whereby the wrapper and the enclosed sheet are formed into a perfect cylinder.

4. A facsimile machine having a flexible wrapper mounted at one end and adapted to receive a sheet of paper for inside scanning, a cylindrical support associated with said wrapper, a curved rigid lip secured to the free end of said wrapper, said lip being provided with a tailpiece, and mechanism connected to said lip for closing the wrapper around said cylindrical support, said mechanism including a latch-like element which pushes against said tailpiece to hold the tip portion of the lip pressed against said support.

5. A facsimile machine having a flexible wrapper supported at one end and adapted to enclose a sheet in cylindrical form for inside scanning, side flanges cooperating with said wrapper to shape it into cylindrical form when the wrapper is closed, a curved rigid lip secured to the front end of the wrapper, the curvature of said lip corresponding to the curvature of said flanges, a lever having a pivotal connection with said lip, mechanism for operating said lever to close the wrapper around said cylindrical flanges, and a member automatically actuated by said lever to rock said curved lip into a position which enables said lever to carry the lip against said cylindrical flanges, whereby said lip closes the wrapper and the enclosed sheet into a perfect cylinder.

6. A facsimile machine having a flexible wrapper mounted at one end and adapted to receive a sheet of paper for inside scanning, a cylindrical support associated with said wrapper, a curved rigid lip secured to the free end of said wrapper, a tailpiece on said lip, and cam means engaging said tailpiece and automatically actuated by said lever to rock said curved lip relatively to the wrapper and hold it firmly against said cylindrical support, whereby said lip closes the wrapper and the enclosed sheet into a perfect cylinder.

7. A facsimile machine having a flexible wrapper mounted at one end and adapted to receive a sheet of paper for inside scanning, a cylindrical support associated with said wrapper, a curved rigid lip secured to the free end of said wrapper, a lever having a pivotal connection with said lip, means for operating said lever to close the wrapper around said cylindrical support, and a member having a pin-and-slot connection with said lever so as to be carried along by the closing movement of the lever to rock said curved lip relatively to the wrapper and hold it firmly against said cylindrical support, whereby said lip closes the wrapper and the enclosed sheet into a perfect cylinder.

8. A facsimile machine having a flexible wrapper supported at one end and adapted to enclose

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a sheet in cylindrical form for inside scanning, means cooperating with said wrapper to shape it into cylindrical form when the wrapper is closed, a curved rigid lip secured to the front end of the wrapper, a lever having a pivotal connection with said lip which is provided with a tailpiece, a member having a pin-and-slot connection with said lever, one end of said member having a cam edge arranged to be engaged by said tailpiece, and a spring connected to the other end of said member so as to cooperate with said pin-and-slot connection during the closing

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movement of the lever to hold said member in a position where said cam edge rocks the curved lip against said flanges, whereby said lip closes the wrapper and the enclosed sheet into a perfect cylinder.

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Number	Name	Date
2,511,892	Wise	June 20, 1950