

Nov. 28, 1961

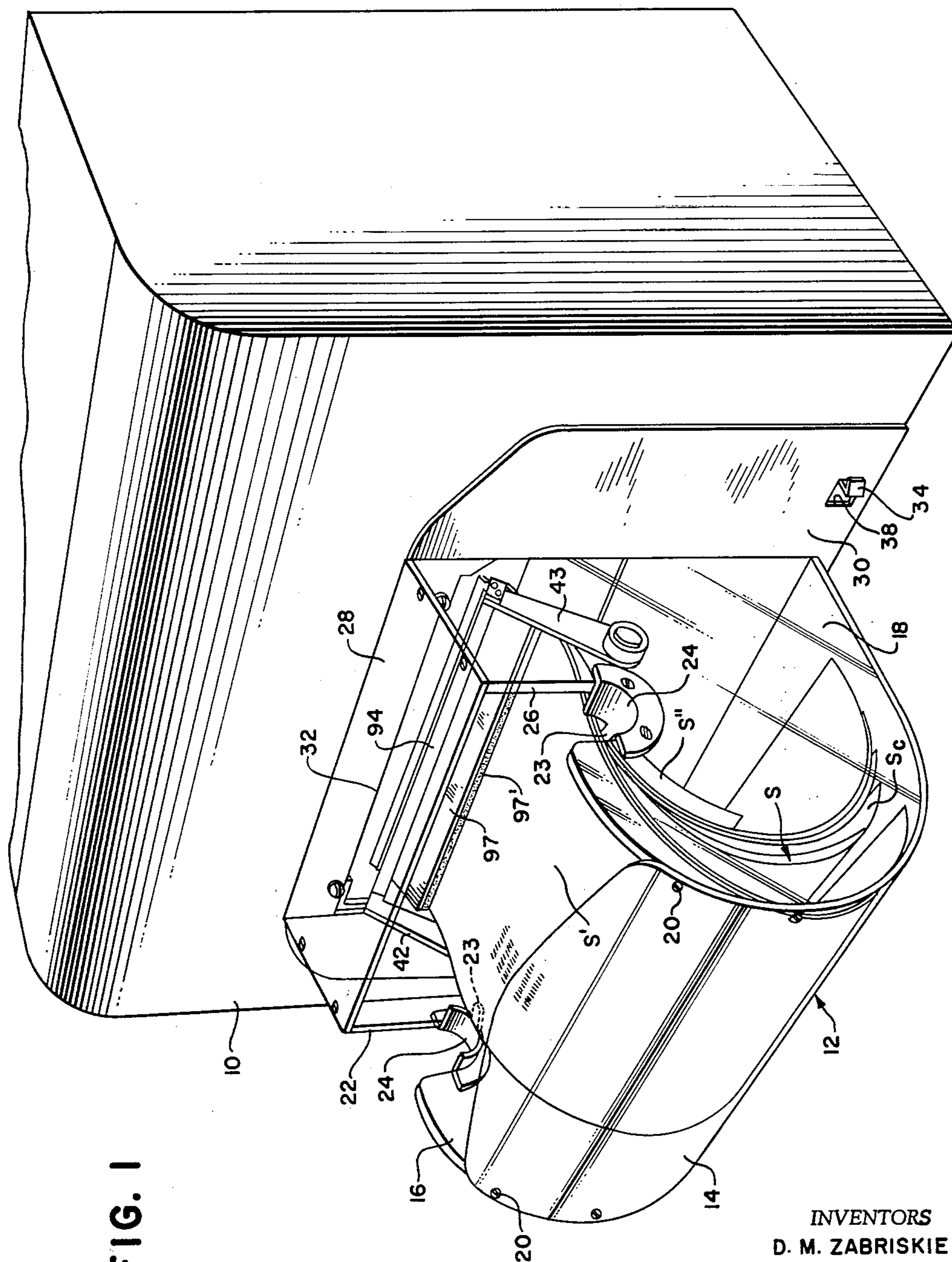
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3,010,717

MESSAGE ACCUMULATOR FOR RECORDERS

Filed June 17, 1959

6 Sheets-Sheet 1



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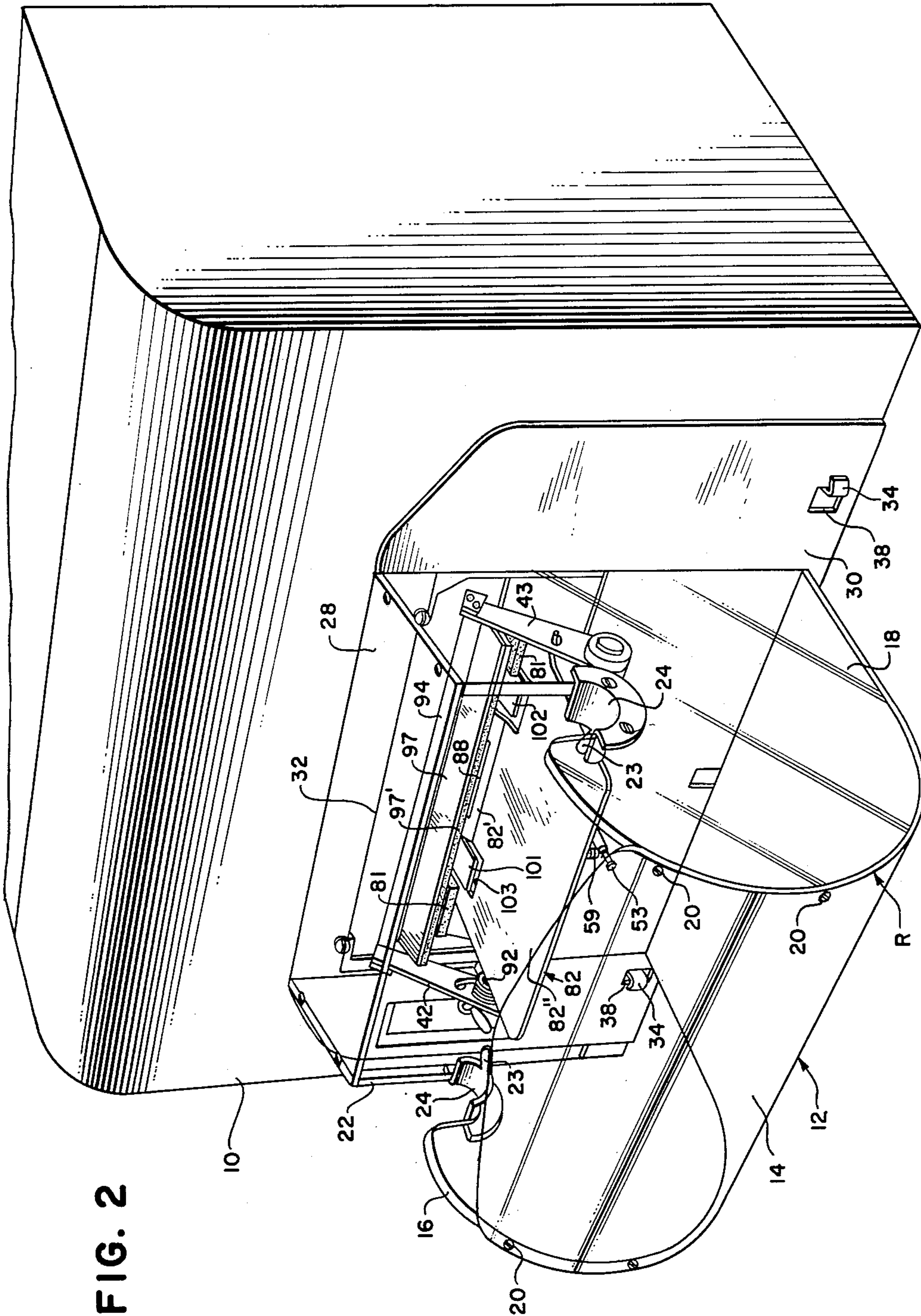
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FIG. 2



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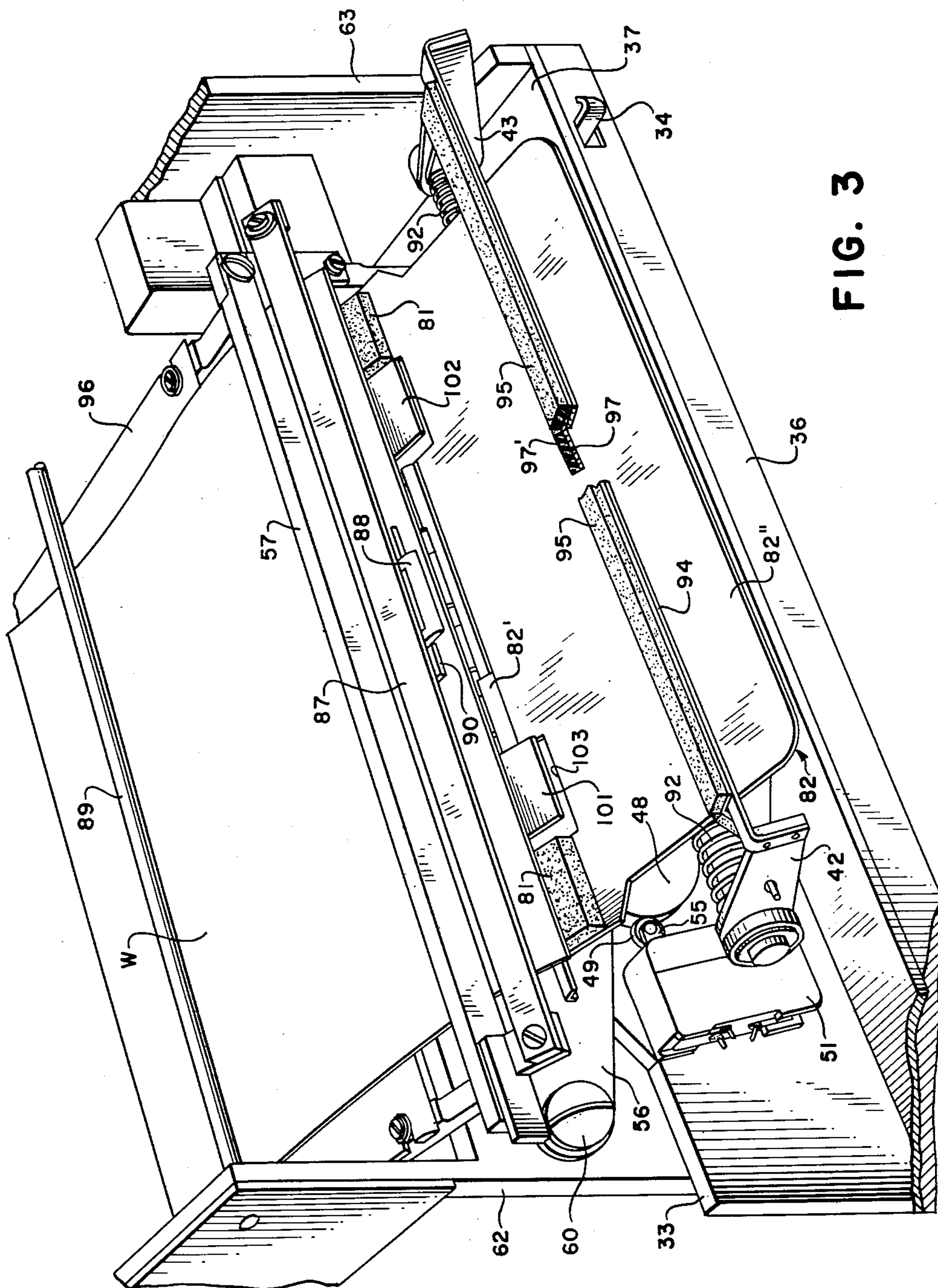


Fig. 3

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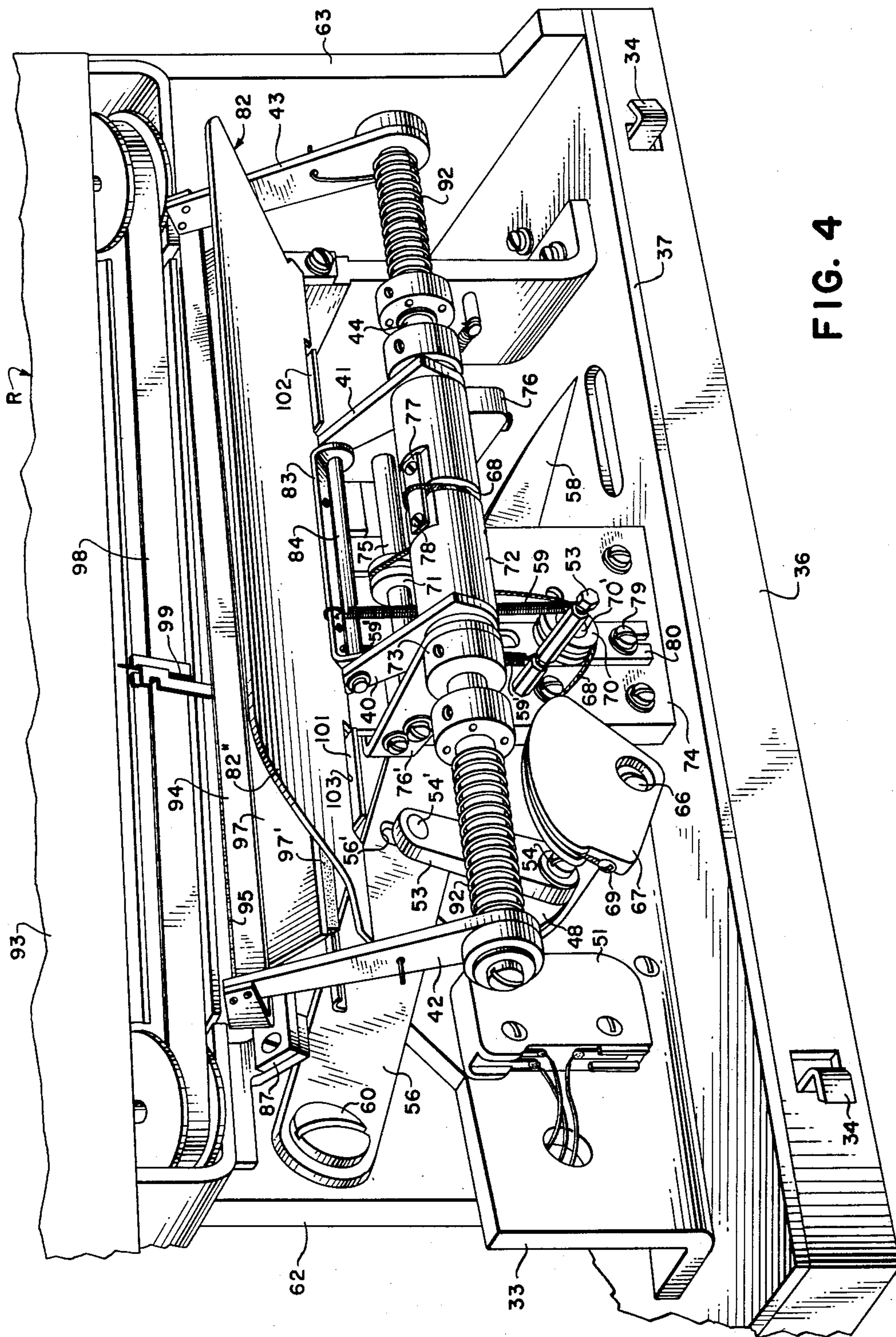
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6 Sheets-Sheet 5

FIG. 5

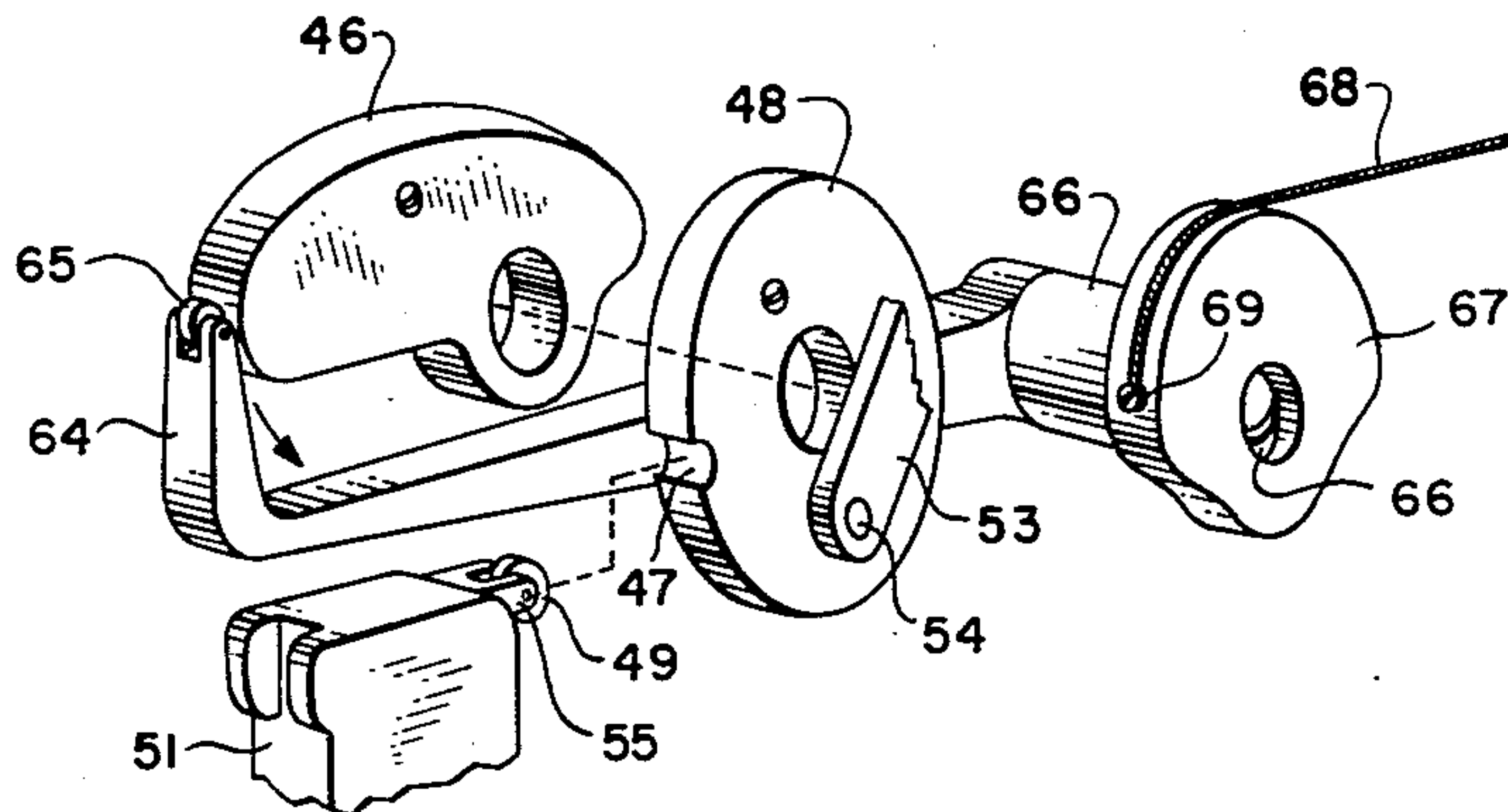
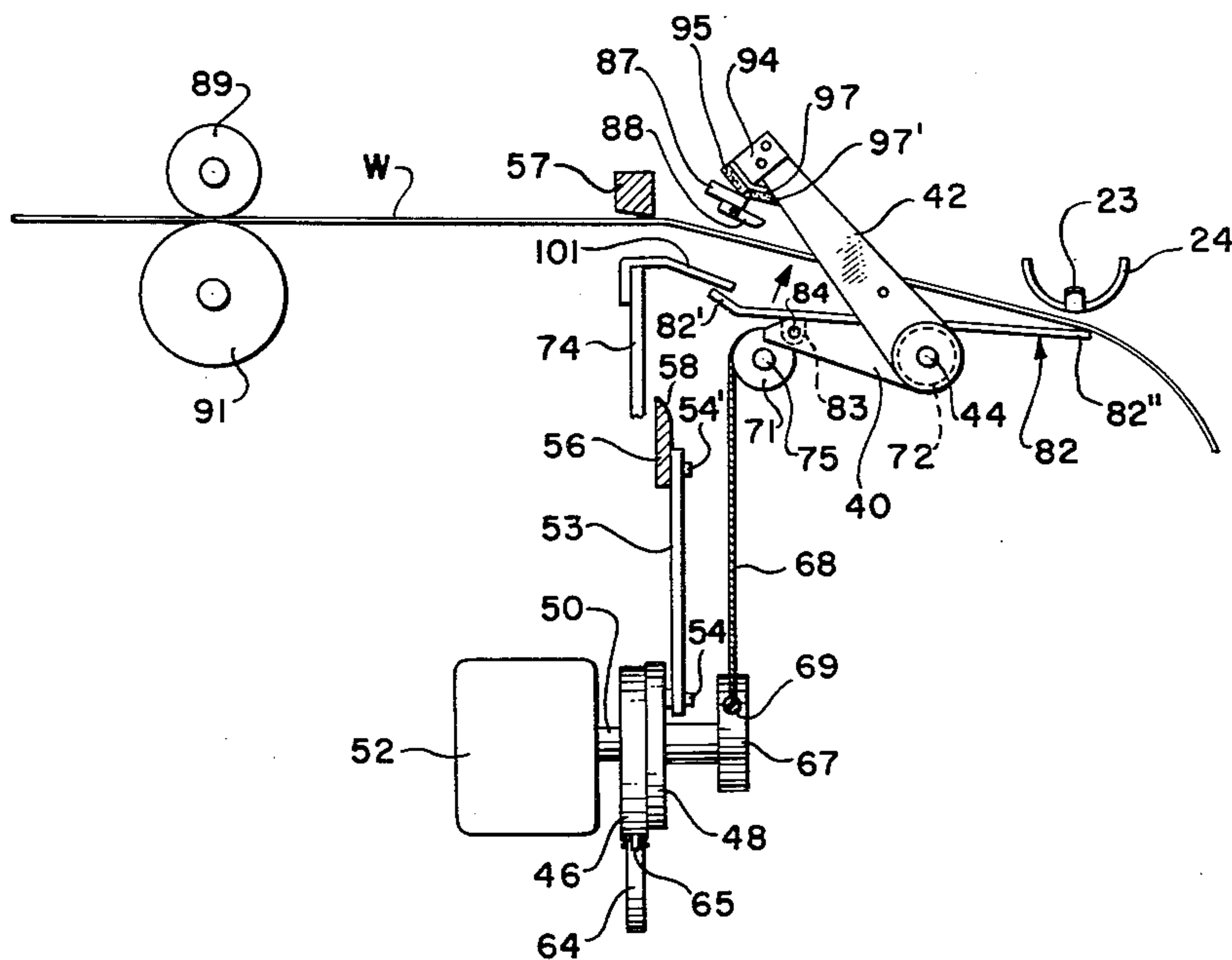


FIG. 6



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MESSAGE ACCUMULATOR FOR RECORDERS
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8 Claims. (Cl. 271-87)

This invention concerns a message accumulator for a recorder.

The invention is directed at a device for stacking sheets of random or uniform lengths discharged from an automatic page recorder of the telegraphic or facsimile type. According to the invention there is provided a stacking device which does not interfere with the recording operations of the recorder. Completed, stacked sheets of messages can be removed from the recorder without disturbing the recording of incoming messages. The device is free of shock hazard in removing sheets of completed messages.

It is a principal object of the invention to provide a message sheet stacking device in which successive sheets are inserted underneath a stack of sheets.

It is a further object to provide a cam operated device for lifting a stack of recorded sheets and inserting successively recorded sheets thereunder.

Another object is provision of message sheet stacking device wherein a plurality of sheets are discharged from the stack when it reaches a predetermined size or weight, leaving the remainder to be lifted for insertion of successive message sheets thereunder.

Other and further objects and advantages of the invention will become apparent from the following detailed description taken together with the drawing, wherein:

FIG. 1 is an external perspective view of a recording device embodying the invention, showing a recorded stack of message sheets supported thereon;

FIG. 2 is a view similar to FIG. 1 of the device with the sheets removed;

FIG. 3 is a perspective view of internal parts of the device showing parts of the sheet stacking mechanism;

FIG. 4 is a perspective view of the device showing other parts of the sheet stacking mechanism;

FIG. 5 is a perspective view of portions of a cam mechanism employed in the invention; and

FIGS. 6-10 are diagrams of portions of the sheet stacking mechanism showing various positions assumed thereby while performing a sheet stacking operation.

Referring to FIGS. 1 and 2, there is shown a recorder having a generally rectangular boxlike cover 10 on which is detachably mounted a transparent plastic receptacle 12. The receptacle has a bottom and front formed from a single curved plastic plate 14. Flat transparent plastic plates 16 and 18 are secured to the lateral edges of plate 14 by screws 20 to form sides of the receptacle. Cut-outs or recesses 22 in the side plates 16 and 18 support arcuate thimbles 24 having inwardly extending lugs 23. The thimbles are adapted to serve as finger guides for an operator in removing stacked sheets 8 from the receptacle. Lugs 23 serve as supports for a stack of sheets. The side plates have upstanding side wall portions 26 on which is secured a horizontal transparent plastic cover plate 28. The rear of the receptacle is substantially closed by a metal plate 30 attached to the cover 10. The plate 30 has a rectangular opening 32 through which successive message sheets S are passed into the receptacle. Spring elements 34 mounted in the base of the chassis enclosed by the cover are detachably engaged in lateral bottom openings 28 in plate 30. These springs can be

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pressed inwardly toward each other for removing the cover and receptacle from the base which is best shown in FIGS. 3 and 4.

The base includes a rectangular base frame 36 on which is mounted a base plate 37 carrying the sheet stacking mechanism. This mechanism includes a first pair of levers 40, 41 and a second pair of levers 42, 43. The levers are cam operated and pivoted on a stationary common shaft 44, keyed to stationary frame member 76' by collar 73. A cam 46, best shown in FIGS. 5 and 6, is juxtaposed to and rotates with a crank wheel 48 on a shaft 50 of a motor 52 in circuit with a switch 51. The switch is mounted on frame plate 33. The motor drives the crank and a connecting link 53 engaged between pin 54 on the crank and a pin 54' at slot 56' of knife 56. The knife has an upwardly directed cutting edge 58 for coaction with a knife bar 57 in cutting off a recorded length of a paper web W. The knife 56 is supported at one end on a pivot 60 on stationary plate 62 of the frame of the chassis. Knife 57 is supported on side wall 63 of the chassis frame and on plate 62.

Crank wheel 48 as shown in FIG. 5 is provided with a notch 47 in which roller 49 on the movable arm 55 of switch 51 engages for stopping the knife 56 at the proper point in the operating cycle of the recorder.

A cam follower arm 64 provided with a contacting roller 65 is pivotally mounted on a shaft 66 journaled in the frame plate 33 of the chassis. The arm 64 is oscillated by the cam 46 as the cam rotates. Attached to shaft 66 is a further cam follower member in the form of a quadrant plate 67 having a cord or cable 68 secured thereto by screw 69. The cable 68 is entrained over the upper curved edge of the plate 67 around centrally grooved pulleys 70, 71 and 72, best shown in FIG. 4. Pulley 70 is secured to a shaft 70' journaled in frame plate 74 of the chassis. Pulley 71 is mounted on a shaft 75 journaled between frame members 76 and 76'. Pulley 72 is actually the hub of levers 40, 41. The cable 68 terminates on an anchoring strip 77 secured to pulley 72 by screws 78. Pulley 70 is adjustable vertically on plate 74 by means of screws 79 engaged in slots of a bearing plate 80 for the shaft of the pulley. By adjusting vertically the position of plate 80, it is possible to adjust the tension in cable 68 and to adjust the length of its travel during operation of the mechanism. Secured to a plate 82 are springs 59, 59' anchored on a pin 53 on plate 74 for biasing the forward end of the plate downwardly.

The levers 40, 41 carry plate 82 which has a bracket 83 engaged on a rod 84 mounted between the levers at the upper ends thereof. The plate 82 is thus pivotable with respect to the levers 40 and 41. Comb fingers 101 and 102 are rectangular plates supported above plate 82 by frame member 74. These comb fingers 101 and 102 guide the leading end of the sheet or web W as it passes over the edge 82' of plate 82 as shown in FIGS. 6 and 10. Cut-outs 103 in plate 82 permit the plate to descend below the level of the comb fingers during the operating cycle of the mechanism. On the side wall 63 and plate 62 of the frame of the recorder is mounted a transverse bar 87 which carries a stop element 88 at the center thereof. This element is a short strip carried pivotally between trunnion brackets 90 on the bar. Element 88 projects forwardly and is so mounted that it can only pivot downwardly, since it is limited in upward movement by contact with the underside of bar 87. The stop element 88 is preferably biased to the forward position shown in FIG. 3 by springs on the pivots of the trunnions engaged in brackets 90.

Levers 42, 43 are biased by coil springs 92 on shaft

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44 so that their upper ends normally rest on bar 87. The upper ends of the levers are connected by and support a transverse bar 94 having a sponge rubber pad 95 secured to the side of the bar abutting bar 87. In FIG. 3 the bar 94 is shown held in a retracted position along with plate 82 and levers 42, 43 to show the element 88 more clearly. It will be noted that the paper web W is drawn over a platen 96 under knife 57 and under a guide plate 97. Plate 97 is integral with bar 94 and extends forwardly therefrom as shown in FIG. 1. A resilient friction pad 97' is secured to the underside of plate 97.

In FIG. 4 the recording mechanism R includes an endless belt 98 carrying styli 99 shown disposed over the paper web W upon which a recording is being made. This recording mechanism is of a known type and forms no part of the present invention. In FIG. 3 the recording mechanism R is turned rearwardly to expose the paper web upon which the recording is made. Resilient pads 81 are provided on plate 82 to assist in gripping sheets during the stacking operation to be described.

In operation of the mechanism, while a message is being recorded on the web W, it passes between rollers 89, 91, under knife 57, over comb fingers 101, 102, and plate 82, under bar 87 and thimbles 24; see FIG. 6.

The cam timing is such that just as the knives 56, 57 complete a cut of the paper web, follower plate 67 pulls cable 68 causing levers 40 and 41 to rise so that the plate end 82' grips the severed sheet S' against the unyielding stop element 88. As levers 40 and 41 continue to rise the longer end 82'' of plate 82 rises, pivoting around rod 84, to lift the severed sheet S' above the thimble lugs 23, as clearly shown in FIG. 7. As the movement of cam 46 continues, plate end 82' slips off element 88 and the sheet S' is then gripped between plate 82 and the pad 97' on the underside of bar extension 97 as shown in FIG. 8. Simultaneously plate end 82'' falls depositing the forward end of sheet S' upon the thimble lugs 23 as shown in FIG. 9.

As the cam 46 continues to rotate, arm 64 which is following the cam begins its return or up stroke. This causes the trailing end E of the severed sheet to be deposited on the top of bar 87 while the short end 82' of plate 82 slips past the yielding stop element 88 as shown in FIG. 9. The severed sheet is now held between bar 87 and pad 95 on bar 94. Plate 82 retracts from the severed sheet entirely. Succeeding sheets S'' are similarly handled to form a stack in consecutive order always building up by insertion of new sheets at the bottom of the stack S as shown in FIG. 10.

The gripping force exerted by bar 94 can be adjusted by regulating springs 92 so that after the stack reaches a certain weight, the agitation of the stack caused by the movements of levers 40—43 permits the sheets SC in the middle of the stack to slip from the grip, removing their weight from the levers so that overloading of the motor 52 and other parts of the mechanism is avoided. The forward ends of the sheets are retained in the curved end plate 14 of the receptacle 12 from which they can easily be removed through the open top of the receptacle, as indicated in FIG. 1.

It is important to note that in the present invention the stop element 88 performs a most essential function in interfering with the rising movement of the short end 82' of plate 82 to cause the longer forward end 82'' of plate 82 to rise above the thimbles 24 and raise the entire stack of sheets. Thus when the plate 82 retracts to the original position shown in FIG. 6, it is ready to receive a new sheet S'' for insertion at the bottom of the stack S. Each time the plate 82 rises and slips off element 88 it inserts the new sheet at the bottom of the stack, and when the plate 82 is lowered and passes the stop element 88 as shown in FIG. 9, it leaves the stack supported by the legs 23 of thimbles 24 and bar 87 underneath with bar 94 and pad 95 holding the stack at the top thereof.

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When plate 82 slips off element 88, it engages levers 42, 43 lifting them off bar 87 as shown in FIG. 8. At this point the levers 40—43 are all rising together against the torque applied by springs 92 up to the limit of rise produced by the cam 46.

During the return stroke, levers 42, 43 stop on bar 87, while levers 40, 41 and plate 82 continue downwardly under the pull of springs 59, 59' to carry the short plate end 82' past stop element 88. The stop element, as explained above, yields in the downward direction of motion. When levers 40 and 41 come to rest on shaft 75, the stacking cycle is completed and ready to start stacking another sheet at the bottom of the pile S.

There has thus been provided a stacking device in which successive sheets are inserted at the bottom of a stack. The individual sheets can be removed from the recorder without interfering with or disturbing the recording of incoming messages. The severed sheets are held in a stack which is electrically out of contact with the recording portions of the recorder so that no shock hazard is encountered by an operator in removing sheets from the receptacle 12.

While the present invention has been described with reference to a specific embodiment thereof, it should be understood that many modifications are possible without departing from the invention as defined in the appended claims. The scope of the invention is to be construed as coextensive with the broadest of the claims.

What is claimed and desired to protect by Letters Patent is:

1. A message sheet accumulator, comprising a sheet raising plate having spaced parallel trailing and leading edges and being pivotable on an axis located between and parallel to said edges, means for feeding a continuous web over said plate in a direction perpendicular to said edges with the web passing over the trailing edge toward the leading edge of said plate, means to sever the web into successive sheets, cam means to elevate and lower said plate in a predetermined cycle with elevation of the plate starting as each sheet is severed from said web and after a leading edge of said web has passed the trailing edge of said plate, spring biased lever means disposed to receive and hold successive sheets from the elevated plate to form a stack of said sheets with the successive sheets being added to the underside of the stack, and means to separate the plate from the stack after each sheet is added to the underside of the stack and while the elevated plate is being lowered comprising a stop element pivotable in only one direction, said element being disposed to engage said trailing edge of the plate during elevation of the plate and tilt the plate for raising the stack and to permit the trailing edge of the plate to pass while the plate is being lowered.

2. A message sheet accumulator, comprising sheet raising means having spaced parallel trailing and leading edges and being pivotable on an axis located between and parallel to said edges, means for feeding message sheets cyclically one at a time over said sheet raising means in a direction perpendicular to said edges with each sheet passing over the trailing and leading edges in turn, means to elevate and lower the sheet raising means in a predetermined cycle with elevation of the sheet raising means starting as a trailing edge of each sheet approaches the trailing edge of the sheet raising means, spring biased to receive and hold successive sheets from the elevated sheet raising means to form a stack of said sheets with the successive sheets being added to the underside of the stack, means to separate the sheet raising means from the stack after each sheet is added to the underside of the stack while the elevated sheet raising means is being lowered by the second named means, and a receptacle having a curved forward portion, said receptacle being disposed adjacent to the spring biased means, said sheet receiving means being inclined downwardly to permit to discharge a mass

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of sheets from a center portion of the stack into said curved forward portion of the receptacle when the stack reaches a certain size.

3. A message sheet accumulator, comprising a sheet raising plate having spaced parallel trailing and leading edges and being pivotable on an axis located between and parallel to said edges, means for feeding a continuous web over said plate in a direction perpendicular to said edges with the web passing over the trailing edge toward the leading edge of said plate, means to sever the web into successive sheets, cam means to elevate and lower said plate in a predetermined cycle with elevation of the plate starting as each sheet is severed from said web and after a leading edge of said web has passed the trailing edge of said plate, spring biased lever means disposed to receive and hold successive sheets from the elevated plate to form a stack of said sheets with the successive sheets being added to the underside of the stack, means to separate the plate from the stack after each sheet is added to the underside of the stack and while the elevated plate is being lowered comprising a stop element pivotable in only one direction, said element being disposed to engage said trailing edge of the plate during elevation of the plate and tilt the plate for raising the stack and to permit the trailing edge of the plate to pass while the plate is being lowered, and a receptacle having a curved forward portion disposed adjacent to the spring biased lever means, said sheet holding means including a bar inclined downwardly, said bar pressing down on the stack to permit discharge of a mass of sheet from the center portion of the stack into said curved portion of the receptacle when the stack reaches a certain size, whereby overloading of said cam means is avoided.

4. A message sheet accumulator, comprising a sheet raising plate having spaced parallel trailing and leading edges and pivotable on an axis located between and parallel to said edges, means for feeding message sheets cyclically one at a time over said plate in a direction perpendicular to said edges with each sheet passing over said trailing and leading edges in turn, means to elevate and lower said plate in a predetermined cycle with elevation of the plate starting as a trailing edge of each sheet approaches the trailing edge of said plate and after a leading edge of said sheet has passed said trailing edge of the plate, spring means to receive and hold successive sheets from the elevated plate to form a stack of said sheets with the successive sheets being added to the underside of the stack, means to separate the plate from the stack after each sheet is added to the underside of the stack and while the elevated plate is being lowered, and a receptacle disposed adjacent to the sheet receiving and holding means, said spring biased means including a bar inclined downwardly to permit discharge of a mass of sheets from a center portion of the stack into the receptacle, whereby overloading of the plate elevating and lowering means and sheet receiving and holding means is avoided.

5. A message accumulator, comprising a support, a sheet raising plate carried by said support, said plate having spaced parallel trailing and leading edges and being pivotable on an axis located between and parallel to said edges, comb members carried by said support and disposed above the trailing edge of said plate in one position thereof, means to feed successive sheets on to said plate over said comb members in a direction perpendicular to said edges with each sheet passing the trailing and leading edges in turn, means to elevate and lower plate in a predetermined cycle with elevation of the plate starting as a trailing edge of each sheet approaches the trailing edge of said plate and after a leading edge of said sheet has passed said trailing edge of the plate, spring biased means to receive and hold successive sheets from the elevated plate to form a stack of said sheets with the successive sheets being added to the underside of the stack, means to separate the plate from the stack after each sheet is added to the underside of the stack and while the ele-

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vated plate is being lowered, and a receptacle disposed adjacent to the sheet receiving means, said spring biased sheet receiving means including a bar inclined downwardly to permit discharge of a mass of sheets from a center portion of the stack into the receptacle, whereby overloading of the plate elevating and lowering means is avoided, said receptacle including thimble elements providing means for supporting a leading portion of said stack, said stack being raised from and lowered onto said thimble elements by the elevating and lowering of said plate.

6. A message sheet accumulator, comprising sheet raising means having spaced parallel trailing and leading edges and being pivotable on an axis located between and parallel to said edges, means for feeding message sheets cyclically one at a time over said sheet raising means in a direction perpendicular to said edges with each sheet passing over the trailing and leading edges in turn, means disposed to elevate and lower said sheet raising means, means disposed to receive and hold successive sheets from the elevated sheet raising means to form a stack of said sheets with the successive sheets being added to the underside of the stack, and a stop element disposed to engage the trailing edge of the sheet raising means during elevation thereof to tilt the sheet raising means for raising the stack and to permit the trailing edge of the sheet raising means to pass the raised stack while the sheet raising means is being lowered, whereby the sheet raising means is separated from the stack after each sheet is added to the underside of the stack and while the elevated sheet raising means is being lowered.

7. A message sheet accumulator, comprising sheet raising means having spaced parallel trailing and leading edges and being pivotable on an axis located between and parallel to said edges, means for feeding message sheets cyclically one at a time over said sheet raising means in a direction perpendicular to said edges with each sheet passing over the trailing and leading edges in turn, means disposed to elevate and lower said sheet raising means, means disposed to receive and hold successive sheets from the elevated sheet raising means to form a stack of said sheets with the successive sheets being added to the underside of the stack, and a stop element disposed to engage the trailing edge of the sheet raising means during elevation thereof to tilt the sheet raising means for raising the stack and to permit the trailing edge of the sheet raising means to pass the raised stack while the sheet raising means is being lowered, whereby the sheet raising means is separated from the stack after each sheet is added to the underside of the stack and while the elevated sheet raising means is being lowered, the sheet receiving and holding means including a spring biased bar pressing down on the stack and inclined downwardly to permit discharge of a mass of sheets from the center portion of the stack when the stack reaches a certain size.

8. A message sheet accumulator, comprising a sheet raising means having spaced parallel trailing and leading edges and being pivotable on an axis located between and parallel to said edges, means for feeding message sheets cyclically one at a time over said sheet raising means in a direction perpendicular to said edges with each sheet passing over the trailing and leading edges in turn, means disposed to elevate and lower said sheet raising means, means disposed to receive and hold successive sheets from the elevated sheet raising means to form a stack of said sheets with the successive sheets being added to the underside of the stack, and a stop element disposed to engage the trailing edge of the sheet raising means during elevation thereof to tilt the sheet raising means for raising the stack and to permit the trailing edge of the sheet raising means to pass the raised stack while the sheet raising means is being lowered, whereby the sheet raising means is separated from the stack after each sheet is added to the underside of the stack and while the elevated sheet raising means is being lowered, the sheet receiving and holding means including a spring biased bar pressing down on the stack and inclined downwardly to permit discharge

of a mass of sheets from the center portion of the stack when the stack reaches a certain size, there being a receptacle disposed adjacent to the sheet receiving and holding means and including thimble elements to support a forward portion of the stack while a rear portion of the stack is held by the spring biased bar, said stack being raised from and lowered onto the thimble elements by the elevation and lowering of said sheet raising means.

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