March 16, 1971 M. COSENZA 3,570,154

PAGE TURNING DEVICE

Filed Dec. 2, 1968 2 Sheets-Sheet 1

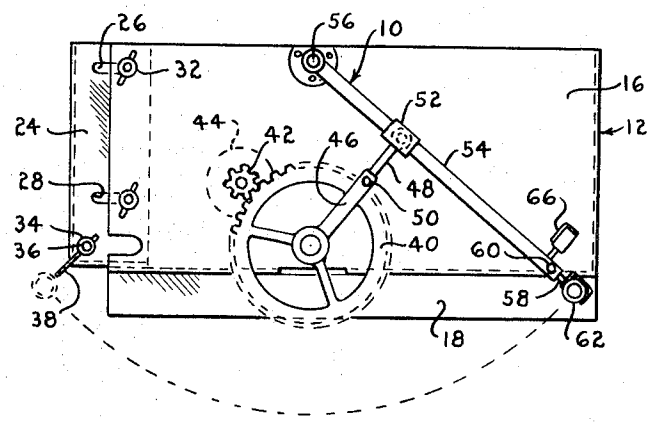



Fig.-2

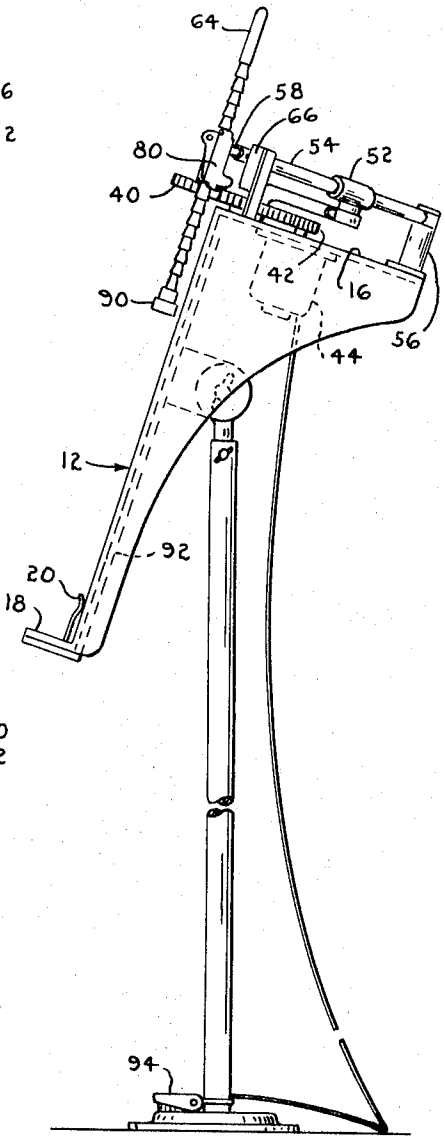



Fig.-1

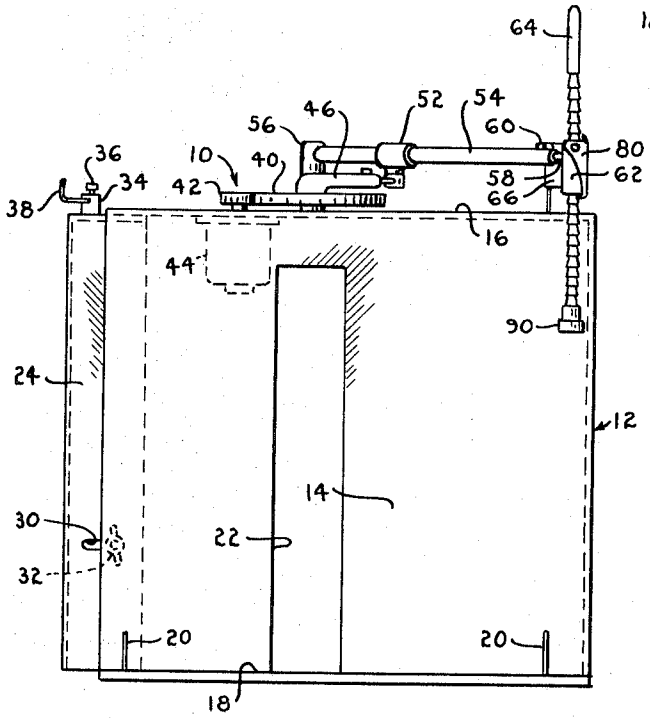



Fig.-3

INVENTOR.
MABEL F. COSENZA
BY Walter Leuca
ATTORNEY

March 16, 1971 M. COSENZA 3,570,154

PAGE TURNING DEVICE

Filed Dec. 2, 1968 2 Sheets-Sheet 2

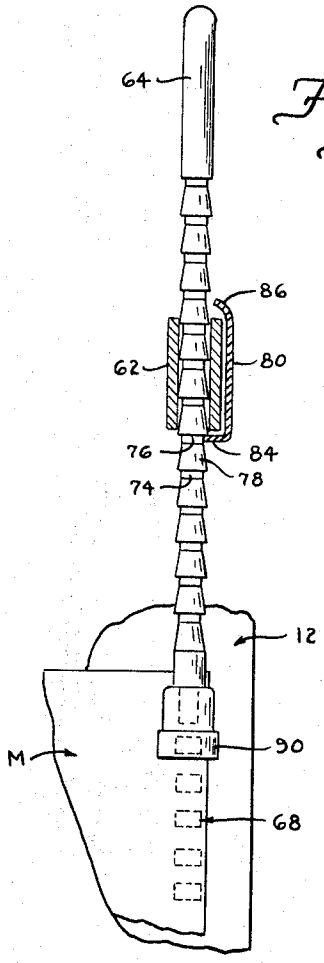



Fig.-4

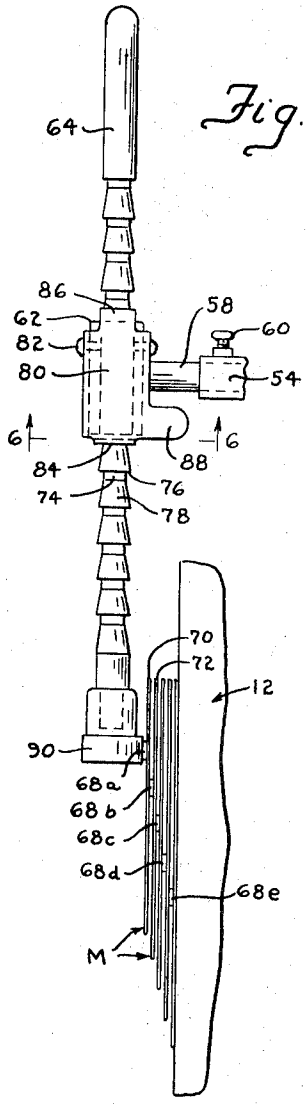



Fig.-5

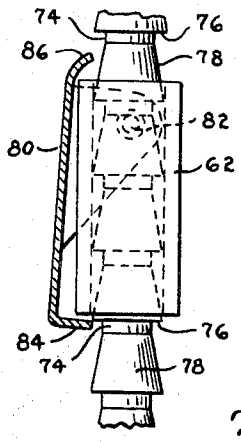



Fig.-7

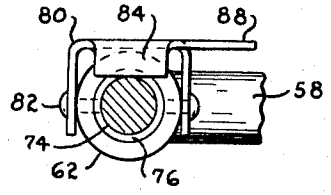



Fig.-6

INVENTOR.
MABEL COSENZA
BY Walter Leuca
ATTORNEY

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3,570,154

# PAGE TURNING DEVICE

Mabel Cosenza, Lake County, Ind.
(3543 Virginia St., Gary, Ind. 46409)

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U.S. Cl. 40—35 10 Claims

## ABSTRACT OF THE DISCLOSURE

A page turning device and a manuscript for use therewith which comprises a stand for supporting the manuscript. Said stand carries a lever which is pivotally movable for cyclic operation effective to turn a page 180°. The distal end of the lever is provided with a sleeve member through which a shaft is longitudinally movable. Means are provided on the sleeve member to retain the shaft in position and is momentarily released when the lever member is pivoted to turn the page 180° to allow the shaft to drop by gravity a spaced distance at which point the shaft is regripped. A magnet is provided at the distal end of the shaft which functions to hold a magnetically attractable element connected to each sheet of the manuscript at a level spaced downward from and in vertical alignment with a magnetically attractable element connecting a preceding sheet. The vertical spacing between the magnetically attractable elements on adjacent sheets is equal to the increment that the shaft is lowered during each cycle.

This invention relates to a page turning device and more particularly to a page turning device which automatically positions the page turning member at a different elevation for each cycle.

The page turning devices of the prior art include page turning members which are fixed at one elevational position relative to the pages to be turned. This gives rise to certain disadvantages resulting from localizing the point of contact with the pages at one position. Consequently, page turning devices which utilize elements attached to the pages for the purpose of co-operating or connecting to the page turning member are required to be attached to the pages at the same elevation, thereby increasing the thickness of the manuscript at that location. This results in an unsightly appearance, also if the manuscript includes many pages the planular surface of the pages become distorted to the point of malfunctioning of the page turning device with the attendant risk of mutilating the pages.

Accordingly, the object of my invention is to provide a page turning device which contacts each page to be turned at different elevations.

Another object of my invention is to provide elements attached to the pages of the manuscript at different levels to evenly distribute the increased thickness of the manuscript the length thereof.

Another object of my invention is to provide a page turning device which is simple and economical to manufacture and easy to operate.

Still another object of my invention is to provide a page turning member which moves automatically to a different elevation to positionally coincide with the element attached to the pages of the manuscript.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings, in which:



FIG. 1 is a side elevation of the page turning device of my invention;

FIG. 2 is a plan elevation thereof;

FIG. 3 is a front elevation of the page turning device;

FIG. 4 is a front view of the page turning member and the support collar therefor in section, in operative relation with the manuscript pages shown in fragment;

FIG. 5 is a side view of the page turning member, support collar and the connecting arm therefor in operative relation with magnetically attractable elements attached to the manuscript pages at spaced levels, the connecting arm and the manuscript pages are shown in fragment;

FIG. 6 is an enlarged cross-sectional view of the page turning member taken along line 6—6 of FIG. 5; and

FIG. 7 is an enlarged view of the page turning member shown in fragment and the support collar therefor showing the escape latch in section.

Referring now to the drawings, particularly FIGS. 1–3 for the present, the page turning device of my invention is designated generally by the numeral **10**. It comprises a book or manuscript stand **12** which is constructed to include a back rest **14**, a top shelf **16** disposed substantially at right angles to back rest **14**, and bottom ledge **18** normally projecting from back rest **14** for supporting the manuscript substantially upright on back rest **14**. Spring clips **20** are also provided at the bottom corners of back rest **14** to maintain the manuscript covers in an open position. Numeral **22** designates an upright recess formed in the mid section of back rest **14** to accommodate, if necessary, the protruding back binding of the manuscript when the manuscript is in the open position.

One side of manuscript stand **12** is open ended to telescopically receive a right angle enframement **24** which serves to laterally extend back rest **14** and top shelf **16**. Slotted apertures **26**, **28** and **30** are provided in enframement **24** for alignment with holes in stand **12** at the one side thereof through which fastening means **32** are inserted for fixing the lateral position of enframement **24** relative to stand **12**. Enframement **24** carries on the top side thereof a mount **34** provided with a hole therethrough fitted with set screw **36** in which is adjustably secured an L shaped bar **38** which serves as a trip lever.

The actuating mechanism for turning the pages of a manuscript is mounted on top shelf **16** of manuscript stand **12**. It comprises a cycling member such as gear wheel **40** mounted on top shelf **16** for rotation. Drive member such as pinion **42** in meshing engagement with gear wheel **40** is connected to the shaft of electric motor **44** suspended from the bottom side of top shelf **16**. It is understood, of course, that the cycling member represented as gear wheel **40** and drive member represented as pinion **42** are illustrative only and may be substituted with equivalent members such as pulley wheels or link members. Gear wheel **40** is provided with a radial arm **46** which is tubular in form to telescopically receive therein extension rod **48**. Set screw **50** fitted in radial arm **46** serves to fix extension rod **48** at a select position. The end of extension rod **48** is formed to pivotally connect sleeve member **52**. Swing lever **54** is pivotally mounted on top shelf **16** as at **56** and is also preferably tubular in form to telescopically receive at the end thereof extension bar **58** to selectively adjust the length thereof. Extension bar **58** is fixed in a select position by set screw **60** fitted in the distal end of lever **54**. Sleeve member **52** encircles swing lever **54** for longitudinal sliding movement thereon. The end of extension bar **58** is provided with a collar or guide sleeve **62** disposed at right angle to bar **58**. Guide sleeve **62** is adapted to carry shaft **64** parallel to back rest **14** and functions to turn the pages of the manuscript 180°. Electric switch **66** is positioned on top shelf **16** to be actuated by swing lever **54**. Switch **66** controls the operation of motor **44** to stop the cycle of operation.

With reference to FIGS. 4–7, my invention accomplishes the sequential turning of the pages of manuscript M by providing clip elements formed from magnetically attractable material, connected to each page thereof. The clip elements which I designate generally by the numeral **68**, may be surfaced on one side thereof with adhesive material to stick in place on the pages of the manuscript, or formed to be clipped or stapled thereon. Clip elements **68** are arranged on the pages so that each clip element is positioned on the vertical margin of the page at a level lower than the clip element on the preceding page. The aggregate of clip elements **68** form a vertical row on the vertical margin of the manuscript. Accordingly, as illustrated in FIGS. 4 and 5, clip elements **68** are arranged so that clip element **68***a* is uppermost on the first page, designated by numeral **70**, clip element **68***b* is connected to the margin of the next page **72** at a level spaced below clip element **68***a*. Clip elements **68***c*, **68***d* and **68***e* are similarly posited on the next following pages in a vertically aligned row.

Shaft **64** is provided with a series of spaced indentations such as notches **74** between elevated sides, one side thereof being formed to provide a normally extending shoulder **76** and the other side thereof being formed to provide an incline **78**. A retaining pawl device such as pivoted latch **80** is connected to guide sleeve **62** by means of pin **82** and is provided at one end thereof with a tongue **84** adapted to fall into one of notches **74** to engage its adjacent shoulder **76** thereby preventing the descent of shaft **64** through guide sleeve **62** further than one notch at a time. The other end of latch **80** is provided with an inwardly angled prop **86** to support the incumbent weight of shaft **64** until tongue **84** of latch **80** is moved inwardly by any convenient means such as a spring acting to pivot latch **80** back to its shaft supporting position, to engage shoulder **76** of the following notch **74**. Prop **86** of latch **80** prevents the free fall of shaft **64** through guide sleeve **62** when tongue **84** is moved away from its engagement with shoulder **76**, and in effect, causes a hesitation in the downward movement of shaft **64** sufficient to allow latch **80** time to return on its pivot and proximately place tongue **84** for engagement with shoulder **76** of notch **74** following the notch **74** just released. Lateral projection **88** is provided on latch **80** to engage the upright bar of trip lever **38** which causes the pivoting of latch **80** against the bias of a spring and the disengagement of tongue **84** thereof from shoulder **76** of notch **74** allowing the gravity drop of shaft **64** to the next notch **74**. A magnet element **90** is fixed to the distal end of shaft **64** and serves to magnetically hold each of clip elements **68** coming in contact therewith. The backside of back rest **14** is adapted to rest on a conventional manuscript stand such as music stant **92**. Foot switch **94** is provided at the base of stand **92** for actuating motor **44** to initiate the page turning cycle.

In the operation of this invention: I provide the right hand vertical margin of each of the pages of manuscript M with a clip element **68** so that it is positioned at the highest elevation on the first page to be turned by the device **10** of my invention. Each succeeding page is similarly provided with a clip element **68** thereon at a level spaced below the level of the preceding clip element a distance equivalent to the space between notches **74** of shaft **64**. As many pages as are notches **74** on shaft **64** may be provided with successively lower spaced clip elements **68** thereon. Repeated series of pages may be similarly provided with clips **68** so that when shaft **64** reaches its farthest descent, shaft **64** may be raised to its uppermost position to repeat the gravity descent on the second, third, etc., series of sequentially clipped pages.

I then adjustably position the radial reach of magnet element **90** at the distal end of shaft **64** to radially coextend with clip elements **68** on the right hand vertical margin of the pages of the open manuscript M resting on book stand **12**. Enframement **24** of stand **12** and trip lever **38** thereon are adjustably positioned so that the upright bar of lever **38** is radially extensive to engage projection **88** of latch **80** against which latch **80** is made to pivot about its connecting pin **82**. The combination of adjustably positioning extension rod **48** relative to radial arm **46**, and adjustably positioning extension bar **58** relative to swing lever **54** will enable the application of my invention to manuscripts of varied widths.



With the above adjustments made, shaft **64** is raised to position magnet element **90** on clip **68***a* of first page **70** to be turned. Foot control switch **94** is actuated to start motor **44**. Gear wheel **40** is caused to rotate together with radial arm **46** connected thereto. Swing lever **54** is pivotally moved on pivot base **56** by means of the sliding connection thereof with sleeve member **52**. The magnetic field of force of magnet element **90** will hold clip element **68***a* thereto and will cause page **70** to follow the radial swing of lever **54** to the opposite side of stand **12** thereby accomplishing the 180° turning of page **70**. At the end of the page turning, the radial swing of lever **54** may continue a slight amount to slide magnet element **90** from clip element **68***a*. At this point, lateral projection **88** of latch **80** engages the fixedly positioned trip lever **38**, causing the pivoting movement of latch **80** and the consequential disengagement of tongue **84** thereof from notch **74** of shaft **64**, causing the gravity drop of shaft **64** one notch. At this position, swing lever **54** starts on its return pivot swing and when gear wheel **40** completes a cycle, swing lever **54** is returned to its start position actuating stop switch **66** to stop the operation of drive motor **44**. In its returned start position, shaft **64** had dropped one notch, and magnet element **90** is in contact with clip element **68***b* of following page **72** and magnetically holds clip element **68***b* preparatory for turning upon actuation of foot switch **94**. This operation is repeated with successive pages until shaft member **64** descends to its lowest position. If the manuscript includes more pages than can be accommodated by a series of spaced clip elements **68** along the longitudinal margin of the manuscript, a second and third series of clip elements **68** may be started on the remaining pages. In this event, upon turning of the last page of a series, the user merely lifts shaft member **64** to its uppermost position to repeat the multiple page turning operation by gravity drop on the following series of clip elements **68** connecting the remaining pages.

While a particular embodiment of the present invention have been herein illustrated and described, it is not intended to limit the invention to such disclosure, but changes and modifications may be made therein and thereto within the scope of the following claims.

I claim:

**1.** A manuscript page turning device comprising:
- a stand including a support for a plurality of stacked pages;
- a lever member mounted on said stand for reciprocating pivotal movement in an arcuate path across said support;
- motive means for reciprocating said lever member;
- a shaft at the distal end of said lever member;
- means at said distal end of the lever member for supporting said shaft for longitudinal sliding movement in the direction of a side edge of a page;
- means responsive to reciprocation of said lever, for sliding said shaft incrementally, one increment for each reciprocation of said lever; and
- means at the distal end of said shaft for engaging a side edge of a page.

**2.** The manuscript page turning device of claim **1** wherein said lever member and the side edge of said page to be turned are radially coterminal.

**3.** The manuscript page turning device of claim **2** wherein said lever member is pivoted by said motive means responsive to a voluntary operable switch and said motive

means being interrupted by the cyclic return of said lever member.

4. The manuscript page turning device of claim 1 wherein said shaft is further characterized as being longitudinally movable by gravity.

5. A manuscript page turning device comprising:
a stand including a support for a plurality of stacked pages;
an arm member mounted on said stand for radial rotation;
motive means for unidirectionally rotating said arm member;
a lever member mounted on said stand;
link means connecting said arm member and said lever member for moving said lever in a reciprocating arcuate path across said support;
a shaft at the distal end of said lever member,
said shaft having detent means spaced along the length thereof;
means at the distal end of the lever member for supporting said shaft for longitudinal sliding movement in the direction of a side edge of a page;
means releasably engaging said detent means of said shaft,
said means responsive to reciprocation of said lever for releasing said detent means, one detent for each reciprocation of said lever; and
means at the distal end of said shaft for engaging a side edge of a page.

6. The manuscript page turning device of claim 5 wherein said shaft is further characterized as being longitudinally movable by gravity between consecutive detent means of said shaft.

7. A manuscript page turning device comprising:
a stand including a support for a plurality of stacked pages and a shelf;
said support and said shelf being laterally extensible;
a lever member mounted on said shelf for reciprocating pivotal movement in an arcuate path across said support;
the distal end of said lever member being longitudinally extensible;
an arm member mounted on said shelf for rotation;
motive means for rotating said arm member;
link means connecting said arm member and said lever member for translating said rotational movement of said arm member to said reciprocating movement of said lever member;
switch means volitionally operable for actuating said motive means;
a second switch means operable by the cyclic return of said lever member;
a shaft at the distal end of said lever member,
said shaft having spaced detent means along the length thereof;
means at the distal end of said lever member for supporting said shaft for longitudinal sliding movement in the direction of a side edge of a page;
means engaging said detent means of said shaft,
said means responsive to reciprocation of said lever for releasing said detent means, one detent means for each reciprocation of said lever; and



means at the distal end of said shaft member for engaging a side edge of a page.

8. The combination of:
a manuscript comprising;
a plurality of stacked sheets for providing sequentially ordered pages,
means connected to each sheet of said manuscript at a level spaced downward from means connected to a preceding sheet, in vertical alignment therewith; and
a page turning device comprising;
a stand including a support for a plurality of stacked pages,
a lever member mounted on said stand for reciprocating pivotal movement in an arcuate path across said support,
motive means for reciprocating said lever member,
a shaft at the distal end of said lever member,
means at said distal end of the lever member for supporting said shaft for longitudinal sliding movement in the direction of a side edge of a page,
means responsive to reciprocation of said lever, for sliding said shaft incrementally, one increment for each reciprocation of said lever, and
means at the distal end of said shaft for engaging said means connected to each sheet of said manuscript.

9. The combination of claim 8 wherein said shaft is further characterized as being incrementally movable by gravity to successively engage said means thereon to said means on each of said sheets.

10. A manuscript page turning device comprising:
a stand for supporting said manuscript in an open position;
a lever member mounted for reciprocating pivotal movement over said stand;
motive means for pivoting said lever member;
a shaft at the distal end of said lever member;
a sleeve member at the distal end of said lever member for supporting said shaft for longitudinally shifting movement in the direction of a side edge of a page;
shaft shift means on said sleeve member for retentively holding said shaft,
said shaft shift means being responsive to reciprocation of said lever, for shifting said shaft incrementally, one increment for each reciprocation of said lever,
trip means on said stand positioned thereon for engaging said shaft shift means for releasing said retentive hold thereof on said shaft; and
means at the distal end of said shaft for engaging a side edge of a page.


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ROBERT W. MICHELL, Primary Examiner

L. R. OREMLAND, Assistant Examiner

U.S. Cl. X.R.

40—104; 84—487, 517