

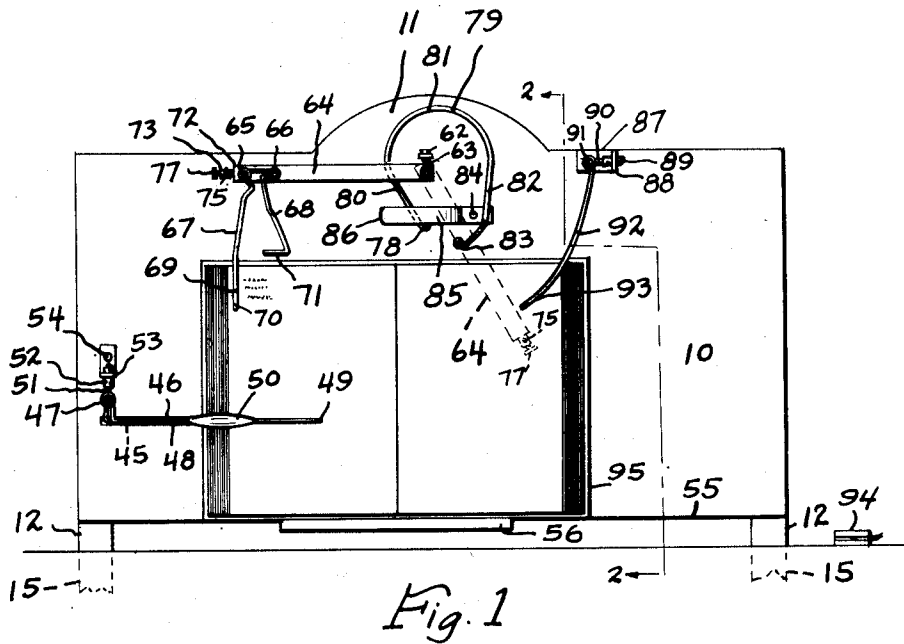
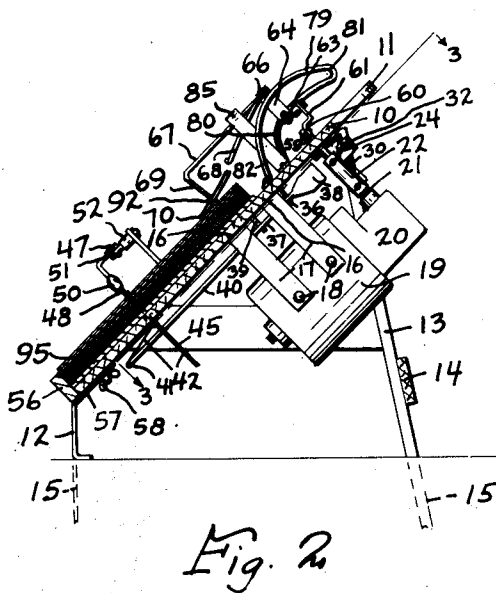
Oct. 17, 1950

E. V. CARPENTER
ELECTRIC PAGE TURNER

2,526,540

Filed Dec. 7, 1946

2 Sheets-Sheet 1



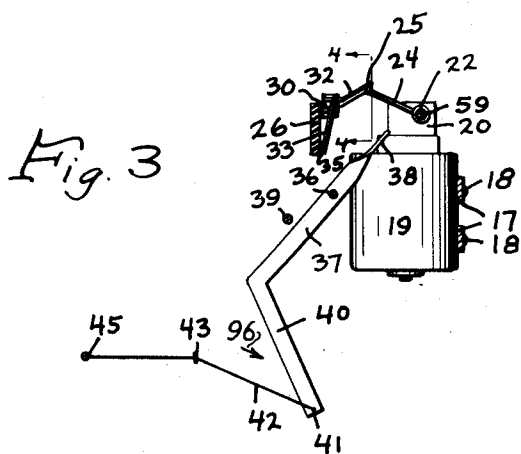
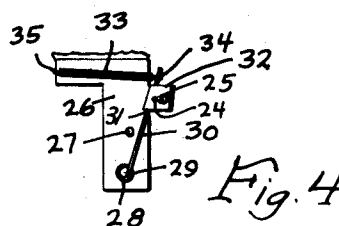
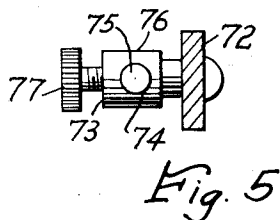
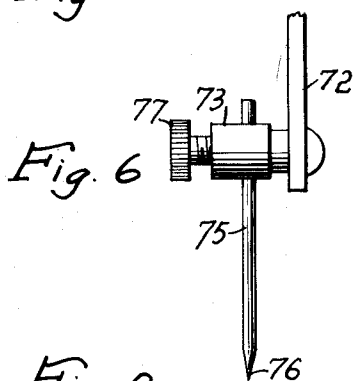
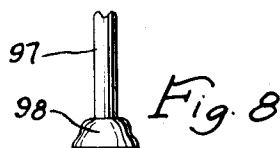
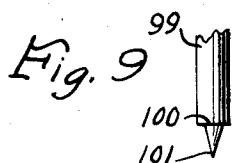
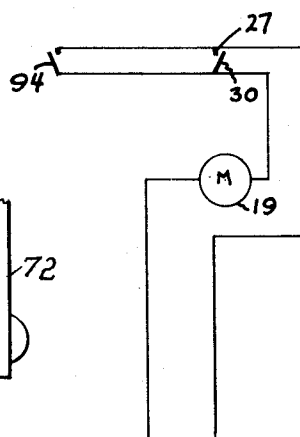
Oct. 17, 1950

E. V. CARPENTER
ELECTRIC PAGE TURNER

2,526,540

Filed Dec. 7, 1946

2 Sheets-Sheet 2



INVENTOR.
Edward V. Carpenter
BY
Sam J. Slotky
ATTORNEY

UNITED STATES PATENT OFFICE

2,526,540

ELECTRIC PAGE TURNER

Edward V. Carpenter, Cherokee, Iowa

Application December 7, 1946, Serial No. 714,882

4 Claims. (Cl. 40—104)

1

My invention relates to a page turning device. An object of my invention is to provide a page turning device which is electrically operated, and which is adaptable for use by persons who are paralyzed, or otherwise incapacitated to the extent that they do not have the normal use of their hands or other limbs for turning the pages of a book.

A further object of my invention is to provide a page turning device which is positive in operation, and which is actuated by means of a simple electric switch, requiring only a minimum of pressure, so that the operator of the device need only press the switch with the foot, or apply pressure at any other portion of the body wherever such pressure can be obtained.

A further object of my invention is to provide an arrangement which will operate on various thicknesses of books, and which will perform the page turning operation regardless of the number of pages already turned.

A further object of my invention is to provide the foregoing objects in a simple construction.

With these and other objects in view, my invention consists in the construction, arrangement, and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of the arrangement,

Figure 2 is a side view taken in section substantially along the lines 2—2 of Figure 1,

Figure 3 is a sectional view of Figure 2 taken substantially along the lines 3—3 thereof,

Figure 4 is a detail of Figure 3 taken along the lines 4—4 thereof,

Figure 5 is a detail of the penetrating needle,

Figure 6 is a forward view of Figure 5,

Figure 7 is a diagrammatic view of the electrical circuit employed in the arrangement,

Figure 8 is a modification of a detail, and

Figure 9 is a further modification.

My invention contemplates the provision of an arrangement for turning the pages of books, and whereby such turning can be effected through the use of mechanical and electrical arrangements so that a paralyzed patient who has not the normal use of the hands can readily turn the pages of the book, thereby not requiring the assistance of nurses or other persons.

I have used the character 10 to designate a flat board or platform which is preferably mounted at an angle from the vertical as shown clearly in Figure 2, the platform 10 including the upper

2

extending portion 11, and attached to the platform 10 are the forward legs 12, and the rearward longer legs 13 which are braced by means of the cross members 14, thus providing a rigid structure. The dotted lines character 15 designates possible extensions of the legs, in the event that it is desired to use the arrangement at higher levels or on easels, etc.

Attached beneath the flat member 10 at 16 are the straps 17 which are attached at 18 to an electric motor 19 which is of the fractional horsepower type and which motor includes a speed reducing gear box 20 to reduce the speed of the device to the required amount, with a shaft 21 extending from the gear box. Attached to the shaft 21 is a collar 22 to which is attached at 23 an extending arm 24 having the rounded extremity 25. An insulating plate 26 is attached beneath the platform 10, and the plate 26 includes a contact 27 attached thereto which passes to suitable leads, as is more fully set forth in the diagram Figure 7. A further lead is attached to a pivotal bearing 28 which bearing 28 is connected at 29 to the upwardly and angularly extending strap member 30 which is attached at 31 to the extending lip 32, which lip 32 in stationary position is in contact with the head 25 of the rod 24, to break the contact between the member 30 and the contact 27. A helical tension spring 33 is attached to the member 30 at 34 and to an extension of the member 26 at 35, this spring thereby serving to exert pressure toward closing of the circuit.

Pivoted at 36 beneath the platform 10 is an arm 37 having the twisted portion at 38, a stop member 39 being attached to the platform 10 to limit strains or extreme movements of the member 37. The member 37 continues into the angularly inclined further portion 40 which is attached at 41 to a thin cable 42 passing through an eye 43, which eye is attached beneath the platform 10, the cable 42 continuing where it is attached at 44 to the end of a rod 45, which rod extends upwardly through a slot 46 in the platform 10, the rod 45 then being bent around the securing screw 47 and thence continuing into the page retaining bar 48 terminating in the end 49, the bar 48 including the weighted member 50. The screw at 47 is attached to a pivotal shaft 51 which rotates within a bearing 52 which bearing is secured in the upstanding member 53 which is attached at 54 to the platform 10. Positioned against the lower edge 55 of the platform 10 is the book supporting flange 56 which is attached to a strap 57 which is adjustably secured by

means of a wing nut 58, to provide for various sizes of books, etc.

Further attached to the collar 22 (see Fig. 2) is a further shaft 59 which is attached at 60 to the member 61 which is attached to a bearing 62 which pivotally receives a short stub shaft 63 which is attached to the strap 64. Attached to the strap 64 at 65 and 66 are the arms 67 and 68, the arms 67 extending into the downwardly bent portion 69 which terminates in the portion 70, the portion 70 being adapted to retain the left hand pages as viewed from Figure 1, the rod 68 terminating in the backwardly bent portion 71, the purpose of which will be explained later.

The strap 64 extends into the downwardly bent portion 72 (see Figures 5 and 6) and attached to the portion 72 is a socket member 73 having an opening 74 for the reception of a comparatively fine needle 75, the needle 75 having a penetrating point 76, which point is preferably bent slightly toward the direction of travel of the member 64. A thumb screw 77 retains the needle in its receiving opening.

Attached at 78 to the platform 10 is a continuous cam member indicated generally by the character 79, which cam member includes the respective portions 80, 81 and 82, the portion 80 being nearly vertical from the platform, and the portion 81 being substantially parallel to the platform and yet rising toward the upper termination of the portion 82, and with the portion 82 sloping downwardly where it is attached at 83 to the platform 10.

Attached at 84 to the platform 10 is an arcuate upwardly extending guide strap 85 which terminates at 86.

Attached at 87 to the platform 10 is an up-standing support 88 including a bearing 89 in which is pivoted a shaft 90 and attached to the short shaft 90 at 91 is the downwardly, and angularly positioned bar 92 which terminates at 93 where it normally rests upon the right hand sheet of the book as viewed from Figure 1.

Suitably connected into the circuit Figure 7 is a small contact switch 94 (see Fig. 1) which can be of any spring type, and whereby pressure against the same will actuate the circuit.

Now that the structure of my device has been explained, I shall explain the operation thereof.

The book which is indicated generally by the character 95 is opened, the lower edges thereof being placed against the ledge 56. The book is also placed so that the extending portion 70 is against the left hand edge of the left hand upper leaf of the book, and with the curved bar 92 being placed so that the termination 93 thereof is against the upper right hand leaf, and as shown in Figure 1. The patient, or operator, then presses the switch 94 through the agency of the foot, a slight arm pressure, or any other means, which closes the circuit and starts the motor 19. The reduction gearing causes the collar 22 to rotate at a slower speed, and as soon as the bar 24 through the rounded head 25 clears the portion 32, the spring 33 will pull the member 30 into contact making position between the points 28 and 27 which thereby maintains the circuit in its closed position so that the motor will continue to operate. The extending bar 64 will first ride along the portion 81 of the cam wire member 79, until it travels around this portion and thence approaches the portion 82 of the cam, at which point the arm will start to descend, the weight of the arm maintaining it in engagement with the cam.

As the arm 64 descends toward the dotted position shown in Figure 1, the projecting portion 71 will momentarily bear against the angularly positioned bar 94, and at practically the same time the point 76 of the needle 75 will penetrate slightly into the upper right hand leaf of the book. The pressure of the rotating arm 64, etc. through the agency of the portion 71 also has the effect of momentarily retarding the needle so that it will not penetrate too deeply, and as soon as the needle penetrates the page, the continued motion of the arm 64 will cause the page to turn toward the left, and the curved arcuate member 85 will then start to carry the arm 64 upwardly, the point still being in contact with the page. As soon as the arm 64 clears the end 86 of the member 85, the arm will drop carrying the portion 70 downwardly against the leaf which has been turned.

At the same time that the above action occurs, the arm 24 will strike against the portion 38 of the pivoted lever member 37 forcing the lever in the direction of the arrow 96 and at the same time pulling on the cable 42 by virtue of its attachment at 41, which draws the bar 45 toward the left as viewed from Figure 1, this action raising the arm 48, so that the page will be allowed to be carried under this arm 48, the arm then dropping by virtue of its weight onto the page and holding it in place. The arm 24 then passes to the position shown in Figure 3, the abutment of the portion 25 against the member 32 again opening the circuit, at which point the moving parts of the arrangement will come to rest, until both of the exposed pages are read by the operator, and the action is thence repeated at the necessary intervals until the entire book is finished. The weight of the bar 92, and the bar 48 are made sufficient so that the pivoting actions will occur freely.

Figure 8 shows a slight modification wherein the needle 75 can be replaced by means of a small bar 97 to which is attached a small roughened rubber gripping member 98 for sliding or moving the right hand page beneath the bar 92, and Figure 9 illustrates a further modification wherein a needle 99 includes the shoulder at 100 and the small penetrating point 101 for limiting the amount of penetration into the page. Any of these modifications can be employed, although I have found the penetrating needle to be the best for the purpose, and in some cases the member 98 can include a slight amount of adhesive substance for carrying the leaf through its motion.

It will now be seen that I have provided the advantages mentioned in the objects of my invention with further advantages being readily apparent.

Some changes may be made in the construction and arrangement of the parts of my invention without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. An electric page turner comprising a book supporting platform, an electric motor attached beneath said platform, a rotatable shaft driven by said motor extending through said platform, an arm attached at the end of said rotatable shaft, means attached at the extremity of said arm to engage individual pages of said book and to turn said pages during rotation of said arm,

5

a cam formed surface attached to said platform against which said arm bears, said cam surface adapted to raise said arm from an already turned page and thence cause said arm to descend toward a page to be turned, a further curved cam member attached to said platform and positioned adjacent to said cam surface to provide means for raising said arm when said page is turned, said arm adapted to drop over the extremity of said cam member after said page is turned, said arm including an extending bar attached thereto for retaining pages already turned, a retaining bar pivotally attached to said platform and adapted to rest upon the pages to be turned, a further extending bar attached to said arm adapted to momentarily bear against said retaining bar during downward movement of said arm, said page engaging means including a needle member having a sharpened point for partially penetrating said pages, a further retaining bar pivotally attached to said platform for forcing turned pages downwardly, means connected between said further retaining bar and said motor to actuate said further retaining bar.

2. An electric page turner comprising a book supporting platform, an electric motor attached beneath said platform, a rotatable shaft driven by said motor extending through said platform, an arm attached at the end of said rotatable shaft, means attached at the extremity of said arm to engage individual pages of said book and to turn said pages during rotation of said arm, a cam formed surface attached to said platform against which said arm bears, said cam surface adapted to raise said arm from an already turned page and thence cause said arm to descend toward a page to be turned, a further curved cam member attached to said platform and positioned adjacent to said cam surface to provide means for raising said arm when said page is turned, said arm adapted to drop over the extremity of said cam member after said page is turned, said arm including an extending bar attached thereto for retaining pages already turned, a retaining bar pivotally attached to said platform and adapted to rest upon the pages to be turned, a further extending bar attached to said arm adapted to momentarily bear against said retaining bar during downward movement of said arm, said page engaging means including a needle member having a sharpened point for partially penetrating said pages, a further retaining bar pivotally attached to said platform for forcing turned pages downwardly, means connected between said further retaining bar and said motor to actuate said further retaining bar, including a cable secured to a bent extension of said further retaining bar, a pivoted lever member attached to said cable, a bar attached to said rotatable shaft adapted to bear against said pivoted lever member for thereby actuating said further retaining bar.

3. An electric page turner comprising a book supporting platform, an electric motor attached beneath said platform, a rotatable shaft driven by said motor extending through said platform, an arm attached at the end of said rotatable shaft, means attached at the extremity of said arm to engage individual pages of said book and to turn said pages during rotation of said arm, a cam formed surface attached to said platform against which said arm bears, said cam surface adapted to raise said arm from an already turned page and thence cause said arm to descend toward a page to be turned, a further curved cam

6

member attached to said platform and positioned adjacent to said cam surface to provide means for raising said arm when said page is turned, said arm adapted to drop over the extremity of said cam member after said page is turned, said arm including an extending bar attached thereto for retaining pages already turned, a retaining bar pivotally attached to said platform and adapted to rest upon the pages to be turned, a further extending bar attached to said arm adapted to momentarily bear against said retaining bar during downward movement of said arm, said page engaging means including a needle member having a sharpened point for partially penetrating said pages, a further retaining bar pivotally attached to said platform for forcing turned pages downwardly, means connected between said further retaining bar and said motor to actuate said further retaining bar, including a cable secured to a bent extension of said further retaining bar, a pivoted lever member attached to said cable, a bar attached to said rotatable shaft adapted to bear against said pivoted lever member for thereby actuating said further retaining bar, a switch member attached beneath said platform including a pair of contacts, a spring urged conducting bar pivotally attached to said switch member and resiliently urged towards contact closing position, said conducting bar including an extension attached thereto against which said bar bears for opening the circuit after said arm has completed its page turning rotation.

4. An electric page turner comprising a book supporting platform, an electric motor attached beneath said platform, a rotatable shaft driven by said motor extending through said platform, an arm attached at the end of said rotatable shaft, means attached at the extremity of said arm to engage individual pages of said book and to turn said pages during rotation of said arm, a cam formed surface attached to said platform against which said arm bears, said cam surface adapted to raise said arm from an already turned page and thence cause said arm to descend toward a page to be turned, a further curved cam member attached to said platform and positioned adjacent to said cam surface to provide means for raising said arm when said page is turned, said arm adapted to drop over the extremity of said cam member after said page is turned, said arm including an extending bar attached thereto for retaining pages already turned, a retaining bar pivotally attached to said platform and adapted to rest upon the pages to be turned, a further extending bar attached to said arm adapted to momentarily bear against said retaining bar during downward movement of said arm, said page engaging means including a needle member having a sharpened point for partially penetrating said pages, a further retaining bar pivotally attached to said platform for forcing turned pages downwardly, means connected between said further retaining bar and said motor to actuate said further retaining bar, including a cable secured to a bent extension of said further retaining bar, a pivoted lever member attached to said cable, a bar attached to said rotatable shaft adapted to bear against said pivoted lever member for thereby actuating said further retaining bar, a switch member attached beneath said platform including a pair of contacts, a spring urged conducting bar pivotally attached to said switch member and resiliently urged towards contact closing position, said conducting

2,526,540

7

bar including an extension attached thereto against which said bar bears for opening the circuit after said arm has completed its page turning rotation, an electric switch member for providing completion of an electric circuit to said motor.

EDWARD V. CARPENTER.

REFERENCES CITED

The following references are of record in the 10 file of this patent:

8

UNITED STATES PATENTS

Number	Name	Date
973,803	Morand -----	Oct. 25, 1910
1,682,884	Broadley -----	Sept. 4, 1928

FOREIGN PATENTS

Number	Country	Date
326,833	Germany -----	Oct. 2, 1920