

Feb. 14, 1950

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2,497,418

ROLLING SUPPORT FOR WRITING INSTRUMENTS

Filed Oct. 29, 1945

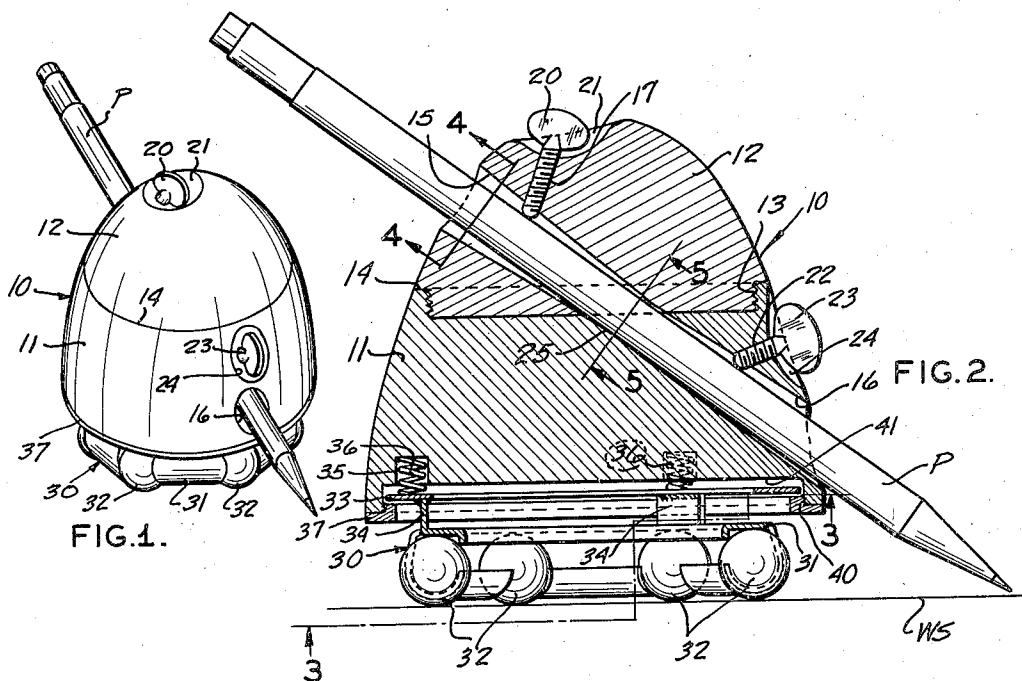


FIG. 1.

FIG. 2.

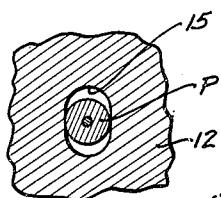


FIG. 4.

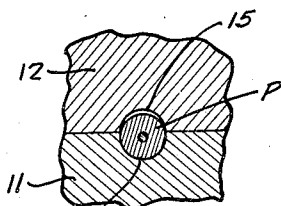


FIG. 5.

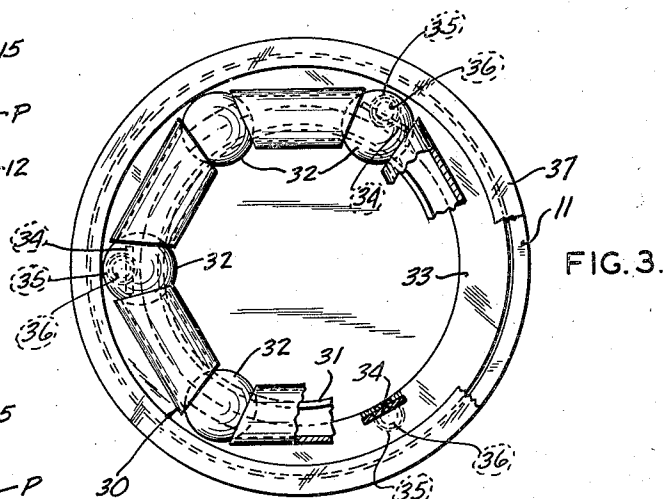


FIG. 3.

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2,497,418

ROLLING SUPPORT FOR WRITING INSTRUMENTS

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Application October 29, 1945, Serial No. 625,351

9 Claims. (Cl. 120-107)

1

This invention relates to improvements in rolling support for a writing instrument, and more particularly to devices for adjustably holding a pen or pencil in such manner that the writing implement may be manipulated for drawing or writing, solely by movements of the shoulder or arm muscles of the user.

In many cases of personal injury, spastic or other types of paralysis, manual or digital impairment or loss, or in the cases of users of artificial hands or arms, and sometimes in beginning writing instruction, it is of considerable advantage to provide for writing movement independently of digital movements or flexion. A number of devices have heretofore been designed, and a few thereof offered to the trade, for various specific applications; for example, drafting devices for contouring work, auxiliary manual devices for primary penmanship instruction, and others for use as holders for caster pens and the like. Devices of the latter class are scarcely adapted at all for efficient usage by persons suffering from manual impairment or loss, and it is accordingly a general objective of the present improvements to provide an improved design of writing aid, particularly, but not exclusively, for the assistance of service men and others using artificial hands or arms; in recovering writing skills. This objective is highly successfully attained by the exemplifying structure hereinafter described.

A further important object of the invention is attained in a universal rolling support for a writing instrument, which conduces to a minimum effort of manipulation incident to both large and small ranges of movement over the writing surface.

Yet another objective importantly attained in the present development, is the provision for a universal rocking movement of a pen or pencil with respect to a horizontal subjacent support of the writing aid, and in such manner as to provide what may be termed a full floating pen support.

An additional and important object is attained in a novel form of connection between a support and holding frame for the writing instrument, such that there is attained a self-releasing or lifting action of the pen or pencil incident to release of the slight manual writing pressure normally employed.

Yet another object in the design of the present assembly throughout, is the use as far as possible, of readily obtainable materials with a minimum of processing and assembly costs, such that the device may be economically produced in reasonable quantities and with a low proportion of labor cost. One feature of this purpose in design is attained by utilization for example, of a standard ball bearing race, as a universal rolling support

2

for the writing aid, to facilitate movements thereof in any direction and with an almost total absence of friction-at-rest.

Yet another valuable objective of present improvements is attained in an improved adjustment of writing angle of pen or pencil, this adjustment being of a type such as to require no tools and no careful manipulative movements, and such that the angle of pen or pencil to the paper may be easily and quickly changed at will.

The foregoing and numerous other objects of the invention will more clearly appear from the following detailed description of a presently preferred form of writing aid, particularly when considered in connection with the accompanying drawing, in which:

Fig. 1 is an isometric view showing the assembly in a position of use;

Fig. 2 is a somewhat enlarged sectional elevation, the sectioned portions of the structure being taken along a vertical median plane through the bore of the body which receives the writing implement;

Fig. 3 is an elevation, partly in section, showing the rolling and supporting assembly of Fig. 2, and as taken along line 3-3 of that figure;

Fig. 4 is a fragmentary sectional view taken along line 4-4 of Fig. 2, and

Fig. 5 is a similar fragmentary sectional view taken along line 5-5 of Fig. 2.

Referring now by characters of reference to the drawing, the supporting body for a pen or pencil is generally indicated at 10. By preference so as to provide a relatively low center of gravity of the assembly and a relatively large base of support to preclude casual tipping, the body 10 is of a general so-called bullet shape, being characterized by diminishing horizontal sections from bottom to top. It is conveniently formed as a substantially solid element constituting, in effect, a frame for receiving the writing instrument. By further preference the body 10 is constructed by molding, say of a thermoplastic or thermosetting material, for example, of a phenol-aldehyde composition. As a convenience in molding and casting, the body 10 is formed of two parts, a lower section 11 and an upper section 12, these body components being detachably assembled as by threading in an annular zone 13, preferably in such manner as to leave a substantially uninterrupted flush surface along the parting line 14 between the sections.

Formed, as by suitable or known coring procedure, partly in each of the sections 11 and 12, is a pen-receiving bore 15 in the upper section which continues into a similar bore 16 in the lower section 11 of the body. Over the major portion of its total length, the diameter of this bore substantially exceeds that of the writing instrument designated by P. A suitable shaping of the bore

3

15 is indicated by Figs. 1 and 4. In an intermediate zone through which the part 15 of the bore merges with the part 16 thereof, the bore is somewhat more restricted, as shown by Fig. 5, so as to form a central fulcrum for the writing instrument P. Directed into an upper portion of bore 15 is a threaded passage 17 for the reception of a set screw 20, preferably in the form of a wing screw, the wing head of which normally extends into a surface depression 21 therefor, near the upper portion of body section 12. Similarly, extending laterally into portion 16 of the pen bore is a threaded passage 22 occupied by a wing screw 23, the head of which extends into a lateral body recess 24 in section 11 of the body frame. From the structure last described, it will appear that the fulcrum portion indicated at 25, in the bore 15—16, constitutes a rocking center in such manner that by selectively threading up or unthreading the screws 20 and 23, the acute angularity of the writing instrument P, relative to the writing surface WS, may be varied within reasonable limits. Further, by slightly backing off both screws 20 and 23, the depth of insertion say of pencil or pen P, in the body 10 may be varied to compensate, for example, for the usual wearing effect on a pencil or the like.

Proceeding now to a description of the provision for rolling support of the body 10, it is a preference not only for best results, but for simplicity of assembly and for ease of service if ever required, to employ a standard ball bearing race generally indicated at 30 and comprising an annular ball retainer structure 31. While the number of balls or other rolling elements is distinctly optional within reasonable limits, six thereof are shown and indicated at 32. A ball bearing race possesses a distinct advantage in use, in that it is characterized by total absence of any initial directioning requirement or resistance, thus enabling a full universal movement of the assembly in the plane of the writing surface. Further, among the various types of rolling support experimentally utilized for the present purpose, this form of bearing exhibits a minimum starting friction, and in use, offers no noticeable resistance even to very minor movements of the writing aid. The advantage in production incident to their ready availability in quantity and at low costs, of bearings of this type, will at once be appreciated.

The primary supporting effect of the bearing race including the retainer, is imparted to the body 10 through an arrangement now to be described, and constituting a universally rockable or floating connection. Thus the vertical axis of the body 10 is enabled to be rocked, within narrow limits, in any direction from the vertical, and without any tendency to assume any one displaced condition. Thus the device is highly sensitive to slight tilting pressures, as for purposes of shading as by rocking the writing implement about its own axis, or in tilting it upwardly or downwardly.

This provision is effected by structure including a mounting annulus or washer 33 which normally occupies a horizontal plane parallel to the writing surface WS. Connection of the annulus 33 to the race 30 is made through a plurality of evenly spaced ears, lugs or supports 34 which are conveniently welded or otherwise attached to the washer 33 at their upper ends, and are attached as by welding to the ball retainer 31 at their respective lower ends. The lugs 34 may be formed if desired, as integral parts of the stock forming

4

annulus 33, and bent downwardly at the desired angle for engagement with the race.

The body section 11 is cored or drilled to provide a plurality of downwardly opening sockets 35, each of a diameter easily to receive a small coil compression spring 36, any suitable plurality of sockets and springs being provided. The springs 36 are of light loading, and their lower ends abut the upper surface of the annulus 33 preferably without interlocking engagement therewith, so that the body and the rolling support may be considered as journaled together, and easily relatively rotated.

Attachment of the parts last described to the body 10 is preferably carried out by the provision of a collar 37 threadedly engaging the lower perimeter or base portion of the body 10, specifically the section 11 thereof, the zone of threading being indicated at 40. It will have appeared that the lower portion of section 11 is formed to provide a circular sunken or undercut area, this countersunk portion being indicated at 41. From this it results that there is provided a definite clearance between the top of the washer 33 and the circular surface of portion 41 at the bottom of the body so that, as will now appear, the rolling support assembly is cushioned against the bottom of the body to enable its universal rocking movement. Such movement is limited of course by the spacing between the washer and surface 41. Experiments have determined that a spacing say of $\frac{1}{16}$ " in this zone is highly satisfactory.

As to assembly of the rolling base structure to the body 10, it will now have become obvious that, upon inversion of the body and location of springs 35 in the sockets 35 therefor, the rolling structure in inverted position is merely dropped into place, the collar 37 is passed over the race and threaded up by interengagement of the mating threads. For this purpose it is of course desirable that the inside diameter of the attachment collar 37 be slightly greater than the maximum diameter of the ball, retainer and race assembly.

The manner of use and advantages of the writing aid as exemplified by the structure described, are thought to have become apparent from the foregoing description of parts, but it may be noted that, considering a usual application of the device, most artificial arms are equipped with a pair of pivoted finger elements which may be convergently and divergently actuated by the user. These finger elements can readily be separated a distance to enable the insertion therebetween and hence a gripping action thereby, on the body element 10 of the present device. A pen or pencil P having been inserted in the bore 15—16, with the point say somewhat less than $\frac{1}{16}$ " above the writing surface, the optimum angle of the writing instrument is adjusted by means of screws 20 and 23. Particularly in the case of a pen, such as a fountain pen for example, the instrument P is rotated about its own axis in a manner to realize a normal presentation of the nib or point, to the writing surface. It should here be noted that the loading of springs 36, collectively considered, is such as normally barely to overcome the weight of the body and writing instrument supported thereby. From this it results that, immediately the slight manual writing pressure is removed from the device, springs 36 will serve to lift the pen or pencil from the paper, thereby obviating any hazard of casual and unintended markings thereon, due to inadvertent rolling action.

The manner of manipulation will, now obvi-

ously, be dependent upon the nature of the written matter, legends, drawing, or other characters desired. It has been proved by a reasonable period of experimental hospital usage that but a short period of learning is necessary to enable handicapped persons to become practically normally proficient, and that the device as described serves fully to attain each and all of the several objectives expressed in and implied from the foregoing description.

Although the improvements have been described by making explicit reference to a presently preferred embodiment, the detail of description is to be understood as illustrative, rather than in any restrictive sense, numerous changes being possible within the scope and intended spirit of the claims hereunto appended.

I claim as my invention:

1. In a device for aid in writing, a body provided with means for holding a pen or pencil at an acute angle to a writing surface, and a body support consisting of an arrangement of spaced anti-friction, universally rotatable members normally in engagement with the writing surface, and a retainer for the rotatable members attached as a unit to, and journaled on the body.

2. In a writing aid, a holder for a pen or pencil, a ball bearing support for the holder consisting of anti-friction balls and a retained therefor, and means by which the holder and retainer are connected to permit both relative rotation and rocking displacement.

3. The combination and arrangement of elements as recited by claim 2, but further characterized in that the holder is formed to present a vertical axis and in which the holder is mounted on the ball retainer to permit a universal rocking movement of the holder in any direction, on the retainer, while the balls of the retainer remain in contact with a writing surface.

4. In a device for aid in writing, a body constituting a holder for pen or pencil, and provided with a substantially circular base area, a plurality of anti-friction balls, a retainer therefor, an annulus assembled to the retainer and a plurality of springs between the annulus and the base of the body, and further characterized by the addition of a collar threadedly related to the body and forming a holder for the annulus, whereby the collar serves to maintain the ball and retainer assembly assembled with the body.

5. In a device adapted for use as a writing aid, a body member, means coacting with the body member for clamping a pen or pencil in acute-angled relation to a writing surface therebeneath, a plurality of ball bearings for universal movement over a writing surface, a retainer coacting with the ball bearings to constitute therewith, a bearing race, a plurality of upstanding elements secured to the retainer, a normally horizontal washer secured to the upstanding elements and disposed substantially parallel to the writing surface, an attachment collar threadedly engaging the body and forming therewith an internal peripheral groove in a lower portion of the body, adapted to receive the washer, and of substantially greater depth than the thickness of the washer, a plurality of coil springs, the body being provided with a plurality of sockets extended upwardly of its lower surface, there being one socket for each of said springs, the springs engaging the washer whereby to provide for a universal

rocking movement of the body on the washer, and hence with respect to the ball race and the writing surface.

6. In a device for aid in writing, a body block characterized by a convexly curved exterior surface and of diminishing, substantially circular sections from its base to the top of the block, the block being provided with an acute angled bore, portions of which are of substantially greater sectional area than necessary to accommodate a pen or pencil, the bore being formed with a fulcrum in its intermediate portion, and a pair of set screws adapted to extend at selective distances into the bore, and selectively manipulable, in coaction with said fulcrum, to vary the angle of pen or pencil in the body block, and means providing an anti-friction rolling support for the body block.

7. In a writing aid, a substantially solid body of substantially bullet shape, and provided with a large bore for a pen or pencil, and extended at a distinctly acute angle to the writing surface, threaded clamping elements extended into the bore in spaced zones therealong, means forming a fulcrum internally of the bore, and coacting with said clamping elements to enable adjustment of angularity of the pen or pencil, and means providing a universally movable rolling support for the body, the support being normally in engagement with the writing surface therebelow.

8. In a writing aid, a body arranged for rolling movement over a writing surface, and provided with a normally sloping bore for the reception of a pen or pencil, the body being of a molded plastic construction and formed of two detachably connected sections, the bore being formed in and between the said sections with a part of said bore located in each section in such manner that, when the sections are assembled, they coact to form a continuous tabular cavity from one side to the other of the body assembly.

9. In a writing aid adapter for use by disabled persons, a body constituting a holder for a writing instrument, a rolling support for the body comprised of a plurality of anti-friction balls and a ball retainer in which the balls are universally movable in any direction along the plane of the writing surface, a plurality of coil compression springs, the body being provided with a series of sockets, one for each of said springs, and means providing a horizontal surface on the ball retainer engaged by said springs, the retainer and body being freely rotatable with respect to each other, and the body being susceptible of universal rocking movement over the retainer and hence with respect to a plane writing surface engaged by the anti-friction balls.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
338,239	Wyche	Mar. 16, 1886
416,003	Logan	Nov. 26, 1889
684,453	Muelberg	Oct. 15, 1901
1,848,605	Conway	Mar. 8, 1932
2,245,116	Rhatigan	June 10, 1941
2,362,992	Dentzler	Nov. 21, 1944