Oct. 25, 1966 A. McCALL PARKER 3,280,831

STEP WALKER

Filed Aug. 31, 1964

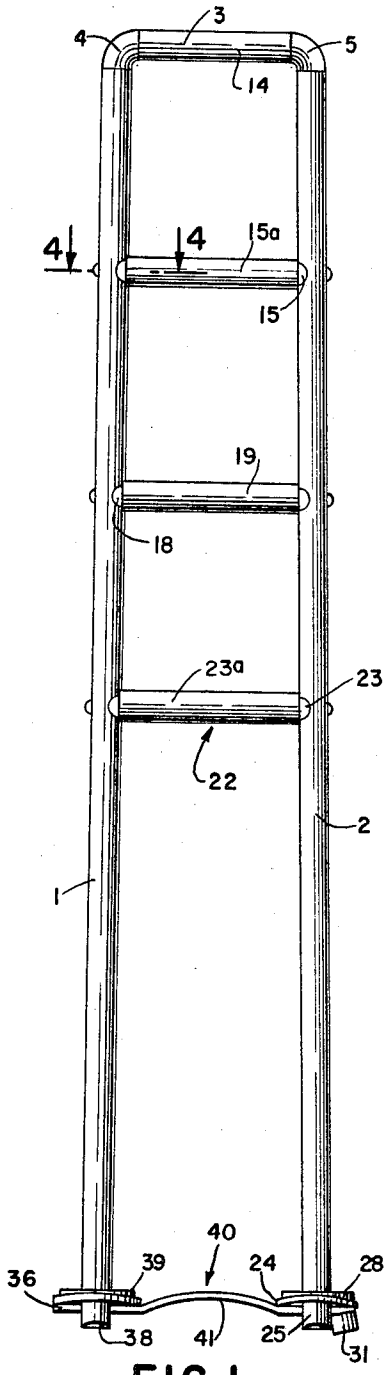



FIG. 1.

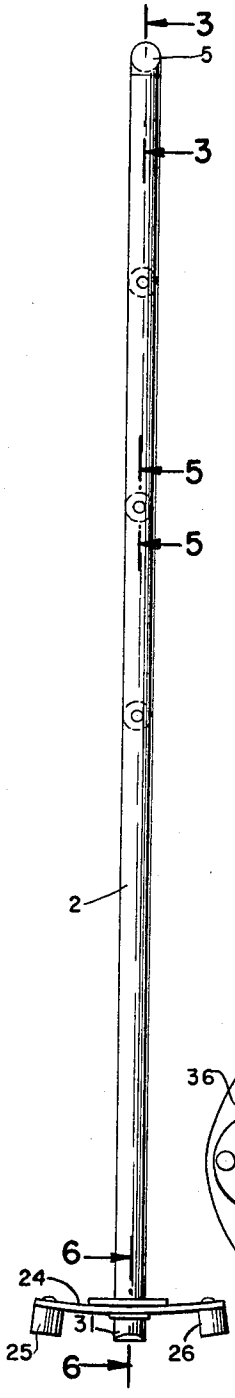



FIG. 2.

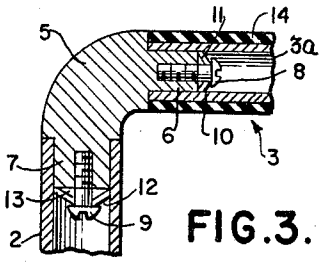



FIG. 3.

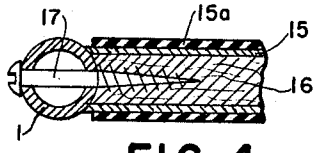



FIG. 4.

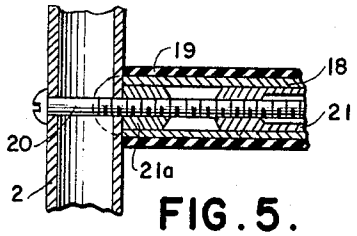



FIG. 5.

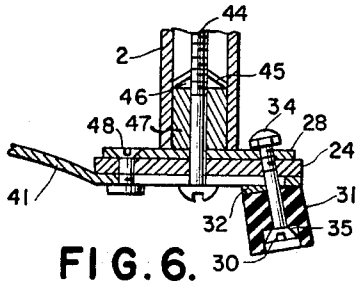



FIG. 6.

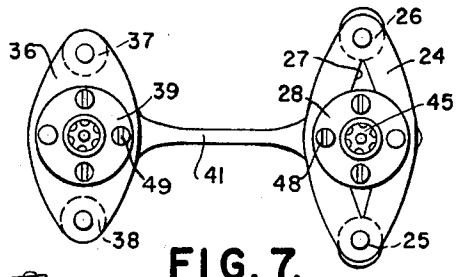



FIG. 7.

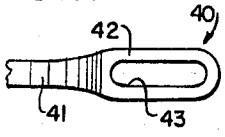



FIG. 8.

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3,280,831

Patented Oct. 25, 1966



3,280,831

# STEP WALKER

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Filed Aug. 31, 1964, Ser. No. 393,230
11 Claims. (Cl. 135—49)

This invention relates to walking aids.

It is the chief purpose of the invention to provide a walking aid which is versatile in use, simple and safe to use by those who require such an aid because of temporary or permanent disablement, and adaptable to a large variety of different conditions of use.

Another object is to provide a walking aid which eliminates much of the danger of slipping in use, and affords an excellent sense of balance to the user, thereby encouraging needed exercise.

A still further object is the provision of an instrument of the kind mentioned which, by reason of a special shape and construction of its foot portion, makes good contact with the floor or other supporting surface, over a relatively wide range of angles of the aid with respect to the supporting surface.

Another object is to provide a walking aid which affords several hand grips at different elevations for regular walking, descending stairs and ramps, ascending stairs and inclines, to assist in sitting down and arising from chairs and seats, and to assist the user in maintaining balance while stooping over as in picking up articles from the floor.

Yet another object is to provide a walking aid which, while light in weight, is strong, fabricated from readily available forms and parts, which may be used singly or in pairs and which, in general, constitutes an advance over the art of walking aids presently available.

A further important object is to provide a foot assembly for a walking aid, which simulates the human foot in making a step and which provides a fine sense of balance as it makes rythmic contact with the walking surface.

Still another object is to provide a lightweight compact walking aid which is of superior utility because of its ability to stand alone upon a supporting surface.

Other objects and advantages of my invention will become clear to those skilled in the art, after a study of the following detailed description, in connection with the accompanying drawings.

In the drawing:

FIGURE 1 shows in side elevation a walking aid embodying the invention;

FIGURE 2 is a view corresponding to FIGURE 1, showing the walking aid in end elevation;

FIGURE 3 is a detail cross sectional view to an enlarged scale, taken in a plane identified by line 3—3, FIGURE 2;

FIGURE 4 is a detail cross sectional view to the same scale as FIGURE 3, taken in a plane indicated by line 4—4, FIGURE 1;

FIGURE 5 is a section to the same scale as FIGURES 3 and 4, taken in a plane identified by line 5—5, FIGURE 2;

FIGURE 6 is a vertical section through the toe or forward portion of the foot, as indicated by line 6—6, FIGURE 2;

FIGURE 7 is a top view of the assembled foot portion removed from the uprights; and

FIGURE 8 is a detail plan view of a portion of the arch forming a part of the foot assembly.

Referring in detail to the drawing, 1 and 2 identify uprights which may, for example, be of ¾" aluminum tubing. As best shown upon FIGURE 3, these uprights are rigidly connected at their tops, by a handgrip generally identified at 3 and which, as shown, is of relatively thin,



light-weight metallic tubing 3*a* of about the same diameter as uprights 1 and 2. A convenient way to connect the ends of grip 3 with the respective uprights is by means of a pair of solid metallic substantially 90° elbows 4 and 5. Thus, referring to FIGURE 3, elbow 5 may have reduced straight ends or extensions 6 and 7 each sized for a snug fit within grip 3 and upright 2, respectively. A pair of machine screws 8 and 9 are threaded into tapped holes in these ends. Confining attention to screw 8, this passes through a central aperture in a conical spring washer 10. A washer 11 of neoprene or like resilient material fits between the end 6 and washer 10. Thus as screw 8 is turned its head engages and expands washer 10 to thereby cause its periphery to firmly engage the inner surface of grip 3 and unite it with elbow 5. The elbow is similarly united firmly with upright 2 so that it is sufficient to identify in addition to screw 9, spring washer 12 and neoprene washer 13. Grip 3 and upright 1 are united with elbow 4 in the same manner as has just been described. Grip 3 is conveniently covered with a tubular layer 14 of rubber, plastic or like material. The ends of this layer lie flush with the circular shoulder formed by the reduced portions of the elbows. The edges may be smoothed with a file to give a neat and attractive finish. The uprights are of such length that grip 3 is positioned at the proper height to aid the user in descending stairs and ramps.

A second grip 15 below grip 3 has its ends supported by and between uprights 1 and 2 in a manner shown upon FIGURE 4. This grip preferably consists of a length of rigid copper tubing 15 of ⅞" outside diameter and having therein and extending therethrough, a ¾" wooden dowel 16 whose ends abut and are shaped to fit smoothly about the uprights 1 and 2, as shown for upright 1. A wood screw 17 passes through diametrically opposite holes in upright 2 and is screwed into the contiguous end of the dowel. A cover 15*a* of rubber or plastic tubing fits snugly over tube 15 and may be secured thereto by adhesive. Tube 15 is connected at its other end with upright 1 in the manner just described. Since dowel 16 is of hard wood it aids in rigidly interconnecting the uprights in a functionally integral way. Hand grip 15 is at the proper height for regular walking. During such use top grip 3 acts at times as a steadying brace in contact with the user's forearm.

FIGURE 5 shows a cross section through one end of the next lower grip, shown as a length of metal tubing 18 having its ends abutting and shaped for a smooth fit about the cylindrical surfaces of uprights 1 and 2, and covered with a length of rubber or plastic tubing 19 fitting snugly thereabout and, if desired, secured to the tubing by adhesive. A machine screw 20 passes through diametrically opposite holes in upright 2 and threads into a rethreaded turnbuckle or core 21 within the tube. A T-butt 21*a* fitting the end of the tube assists in assuring a fit against the upright. Grip 18 is secured at its other end to upright 1 in the same way as has been described in connection with FIGURE 5 for upright 2, so that this grip is connected in a functionally integral manner between the uprights and assists in rigidifying the instrument. This grip, just described, is at the proper height for ascending stairs and ramps, sitting down and getting up from chairs.

The next lower grip generally identified at 22, FIGURE 1, may be identical in construction and attachment to and between uprights 1 and 2, as has been described for grip 18 in connection with FIGURE 5, so that it is sufficient to identify metal tube 23 covered by rubber or plastic tube 23*a* fitting and secured thereabout. Grip 22 is at the proper height to be gripped to maintain balance while the user is bending over as in picking up articles from or near floor level.

The foot assembly of my invention is depicted in detail upon FIGURES 6, 7 and 8, and includes a generally oval

or elliptical toe plate **24**. As shown upon FIGURE 2, the plate is connected with forward upright **2** so that its major axis extends transversely, that is perpendicularly to the common plane of the uprights. It is also noted that the plate is slightly arcuate or curved along this major axis. At its respective ends the plate has attached to its under side, a pair of rubber tips **25** and **26**. When the walker rests upright on its foot assembly, all four tips **25**, **26** **37** and **38** are in contact with the floor. When the user leans or sways to one side or the other, tips **25** and **26** act to steady him to provide a sense of security and balance. These tips are conveniently secured to the plate in the same way as center tip **31** subsequently described. To reduce weight, plate **24** may be provided with a lightening aperture **27** whose exact shape is not critical.

A circular aluminum floor flange **28** is mounted centrally above and in contact with plate **24** and, as shown upon FIGURE 7, has a diameter a little less than the minor or fore-and-aft axis of toe plate **24**. At their forward edges, in the common vertical plane of uprights **1** and **2** the plate and flange are provided with aligned holes receiving a bolt **30**. As shown upon FIGURE 6, the axis of this bolt is inclined slightly forwardly and downwardly in the aforesaid plane. The bolt passes through a central aperture in rubber tip **31** and has its head fitting a counterbore therein. A wedge-shaped washer **32** is interposed between the tip and the lower surface of one end of a connecting arch **41**, so that by turning down the dome-shaped nut **34** on bolt **30** the tip is firmly attached to the foot and, at the same time plate **24**, flange **28** and washer **32** are fixedly secured together. A washer **35** of neoprene or like material fits the counterbore in tip **31** and is interposed about bolt **30**, between its head and the tip, to prevent the tip from pulling off the bolt head.

Due to the forward inclination of tip **31** it is in full-area contact with the supporting surface as the aid tilts forwardly in response to forward movement of the user and thus assists in reducing the possibility of slipping as the aid is inclined forwardly at its maximum angle in use.

A heel plate **36** is connected with upright **1** and, as shown upon FIGURE 7, may also be oval or elliptical in shape. The major axis of plate **36** is also transverse or normal to the common vertical plane of the uprights but is somewhat shorter than the corresponding axis of plate **24**. Rubber tips **37** and **38** are fixed to the under side of plate **36** adjacent the respective ends of its major axis, as clearly shown upon FIGURE 7. All tips **25**, **26**, **37** and **38** are secured to their platts in the same way as has been described for tip **31**, except, of course, that no wedge such as **32** is used. A second circular aluminum flange **39** is used in superposed relation with heel plate **36**. Tips **25**, **26**, **37** and **38** provide four-point support so that the walker will stand by itself without tilting.

To maintain the toe and heel plates in correct relation and to prevent them from turning or quivering slightly I provide an arcuate or arched connector **41** between them. FIGURE 8 shows one end **40** of this arch in plan; and from this figure, in connection with FIGURES 1, 6 and 7, it is noted that it consists of a relatively narrow arched central or body portion having widened ends **42** provided with central longitudinal slots **43** for a purpose subsequently described.

Toe plate **24**, flange **28** and the adjacent end of arch **40** are secured to the lower end of upright **2** by a machine screw **44** FIGURE 6, which passes through aligned central holes in the plate and flange, and through slot **43** in the arch. The bolt passes through and engages conical spring washer **45** in the manner previously described for washer **10** in connection with FIGURE 3. A neoprene washer **46** is interposed between spring washer **45** and the adjacent end of block or plug **47** so that by turning the screw, the forward parts of the assembled foot are rigidly attached to upright **2**. Heel plate **36**, floor flange **39** and the other end of arch **40** are connected in the same way with upright **1**.



One of the features of the invention is that it may be easily adapted for use by persons of different heights, merely by removal of the foot assembly as a unit, by removal of screw **44**, etc., cutting off the lower ends of the uprights to make them of proper length, and reconnecting of the foot assembly. Since as shown, uprights **1** and **2** are relatively inclined at a small acute angle, such a reduction in length of the uprights will slightly vary the separation of screw **44** from its counterpart in upright **1**. It is for this purpose that slots **43** are provided in one or both ends of arch **40**, namely, to compensate for such variation in separation of the screws.

A bolt **48** passes through aligned holes in the flange, plate and arch, FIGURE 6, to hold these parts together in proper relation when detached from the upright. A similar bolt **49**, FIGURE 7, holds plate **36**, flange **39** and arch **40** together at the heel portion of the instrument.

I have thus provided a walking aid which fulfills all of the objects stated. The walker has features and advantages not found in any like instrument presently available. It will stand by itself—a very great convenience considering the difficulty in keeping an ordinary crutch from slipping, sliding and falling flat on the floor. The several grips at various elevations above floor enable the user to perform for himself, movements not practicable with ordinary aids. Thus, for those suffering from arthritis, grip **15** may be used when first arising in the morning when walking is more difficult. Thereafter as stiffness lessens during the day, top grip **3** may be used with a lighter hold for quicker walking, as along the street. The walker may be used in pairs or singly as dictated by requirements of the user. Or one walker may be used with a cane. Top hand grip **3** is also very useful for descending stairs and ramps. When climbing stairs or when sitting down, grip **18** is very useful; and when the user desires to bend over, as in picking up an object from the floor, lower grip **22** has great utility.

The foot assembly is also an important feature of the invention. Since tip **31** is inclined forwardly, it comes into full contact with the floor as the aid tilts forwardly with forward progress of the user and this acts to reduce the possibility of slipping. Should the user temporarily lose balance and lean or start to fall to one side or the other, the corresponding tip **25** or **26** acts immediately to shift the principal point of support in the direction of leaning or falling. The user is thus helped to regain balance and to avoid the possibility of a fall. The normal four-point support formed by tips **25**, **26**, **37** and **38** when the walker is upright, gives an added sense of balance and security, while the slight shift of support to tip **31** as the user advances and raises tips **37** and **38**, acts to steady him and adds confidence to his stride.

While I have disclosed the form of the invention presently preferred by me, numerous alterations, modifications, and substitutions of equivalents will be clear to those skilled in the art, after a study of the foregoing disclosure. Hence the disclosure should be taken in an illustrative rather than a limiting sense; and it is my desire and intention to reserve all modifications, alterations and substitutions within the scope of the subjoined claims. In these claims the term "ground" is used to denote any surface which may be walked on.

Having now fully disclosed the invention, what I claim and desire to secure by Letters Patent is:

**1.** In a walking aid, first and second elongated uprights, first and second parallel discrete hand grip means rigidly interconnecting said uprights in substantially parallel spaced relation at their top ends, and at horizontally spaced points below said top ends, respectively, said elongated uprights being spaced apart by a distance at little greater than the maximum width of the human hand, and a ground-engaging foot assembly connecting said uprights at their lower ends.

**2.** A walking aid comprising first and second elongated uprights, means rigidly interconnecting said uprights in

substantially parallel spaced relation to define a first plane, said means comprising first and second vertically spaced parallel hand grips each connected at its ends to a respective one of said uprights at and adjacent the upper ends thereof, respectively, and a foot assembly fixed with and interconnecting the lower ends of said uprights and including a toe plate and a heel plate, each having ends offset from said first plane on respectively opposite sides thereof, and four ground-engaging tips each fixed to a respective one of said offset ends of said plates.

**3.** In a walking aid, a pair of tubular uprights, first and second discrete vertically-spaced grips rigidly interconnecting said uprights at and adjacent their upper ends respectively, said grips being in substantially parallel vertically coplanar relation, a foot including a plurality of ground-engaging tips, means detachably connecting the lower end of each said upright with said foot and comprising a pair of screws each passing through said foot and into a respective one of said tubular uprights, and expansion means within each said upright, each said expansion means being threadedly engaged by a respective one of said screws, turning of said screws expanding said means to releasably fix said foot to said uprights.

**4.** For use in a walking aid, a floor-engaging foot assembly including generally elliptical discrete toe and heel plates, means adjustably connecting said plates in fore-and-aft coplanar relation with their minor axes substantially in a common horizontal line and their major axes horizontally parallel and spaced along said common line, normal thereto, a first floor-engaging tip secured centrally to said toe plate at the forward edge thereof, second and third floor-engaging tips secured to said toe plate at the respective ends of the major axis thereof, and fourth and fifth floor-engaging tips secured to said heel plate at the ends of the major axis thereof all of said tips being of resilient, friction material.

**5.** The assembly of claim **4**, the major axis of said toe plate being arcuate and said toe plate being concave upwardly along said major axis.

**6.** The assembly of claim **4**, said first tip having its central axis inclined forwardly and downwardly.

**7.** In a walking aid, first and second tubular uprights, a plurality of normally horizontal grips each connected at its ends with said uprights, respectively, and rigidly connecting the same in coplanar, spaced, substantially parallel relation, a foot assembly comprising elongated toe and heel plates, means connecting said plates to the lower ends of respective ones of said uprights with their longitudinal elongated axes normal to the plane of said uprights, and four ground-engaging tips each secured to a respective end of said plates in and along the axes thereof, a fifth tip secured to the forward edge of said toe plate in said plane, the axis of said fifth tip extending downwardly and forwardly with respect to said toe plate, and a strip secured at its ends to and interconnecting said plates.

**8.** In a walking aid, first and second elongated spaced, generally parallel uprights, first, second, third and fourth hand grips each connected at its ends to a respective one



of said uprights to rigidly interconnect the same, said grips and uprights being in a common plane and vertically spaced in said plane, top to bottom, a ground-engaging foot secured to and interconnecting said uprights at their lower ends, said first grip being at a height to be gripped by the user in descending stairs, said second grip being spaced below said first grip at a height to be gripped for normal walking, said third grip being spaced below said second grip at a height suitable for use in sitting down and arising from a seat, said fourth grip being spaced below said third grip at a height for use in bending over to pick up articles at or near ground level.

**9.** A walking aid comprising first and second elongated uprights, means rigidly interconnecting said uprights in substantially parallel spaced relation to define a first plane, said means comprising first and second vertically spaced parallel hand grips each connected at its ends to a respective one of said uprights, and a foot assembly fixed with and interconnecting the lower ends of said uprights and including a toe plate and a heel plate, each having ends offset from said first plane on respectively opposite sides thereof, four ground-engaging tips each fixed to a respective one of said offset ends of said plates, said toe plate being transversely curved concave upwardly, and a fifth ground-engaging tip secured to said toe plate at the forward edge thereof, in said plane.

**10.** The aid of claim **9**, said fifth tip having a central axis inclined downwardly and forwardly in said plane.

**11.** In a walking aid, first and second elongated uprights, first and second parallel discrete hand grip means rigidly interconnecting said uprights in substantially parallel spaced relation at their top ends, and at horizontally spaced points below said top ends, respectively, a ground-engaging foot assembly connecting said uprights at their lower ends, said foot assembly including a forward and forwardly-inclined ground-engaging tip in the plane of said uprights, and a pair of ground-engaging tips rearwardly of said forward tip and spaced from and upon opposite sides of said plane, respectively.


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