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Gooley

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[54] **PICKUP DEVICE FOR WALKING CANE OR CRUTCH**

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[52] **U.S. Cl.** **135/47,** 135/54

[51] **Int. Cl.** **A45b 3/00,** A45b 9/04

[58] **Field of Search** 135/47, 53, 54, 55–59, 135/62; 294/86.24–86.33

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[57] **ABSTRACT**

A pickup device for use at the lower end of a walking cane or crutch. The lower end of the cane or crutch is formed as a hollow tubular member that slidably receives a complementary telescoping post. The lower end of the post serves as a frictional tip for the cane or crutch. The post has a gripper in the form of one or more fingers extending longitudinally alongside it which move longitudinally with the post and are received within the tubular end of the cane or crutch when the post is recessed. The gripper is spring biased to permit it to protrude radially outward from the post when the post is extended.

6 Claims, 9 Drawing Figures

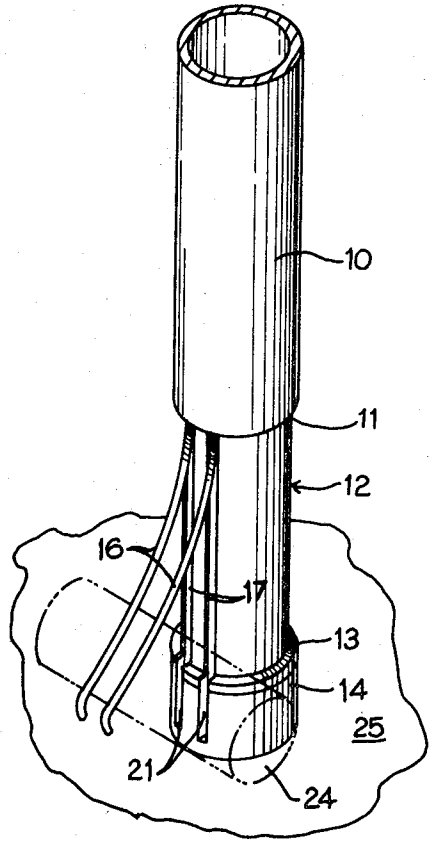


FIG. 3

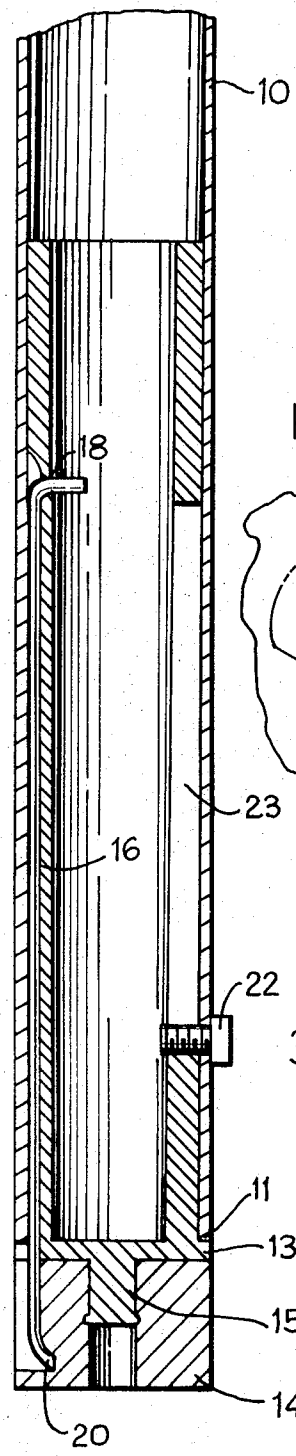
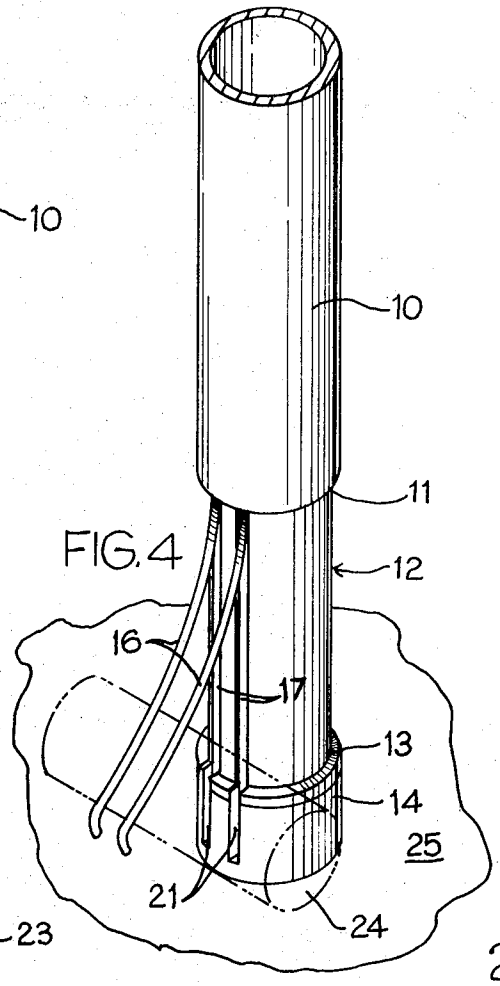


FIG. 4



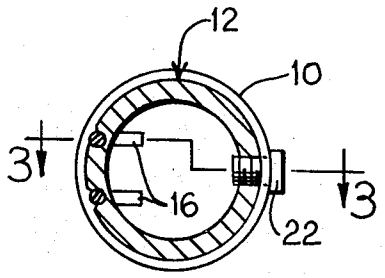
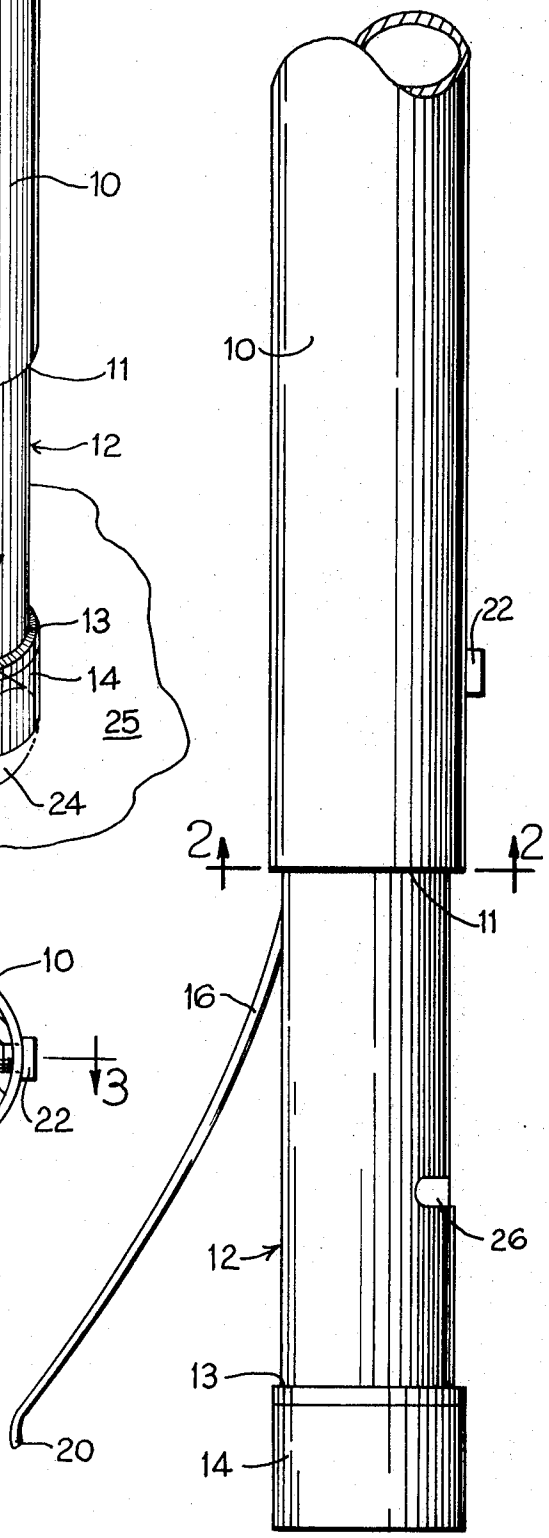


FIG. 2

FIG. 1



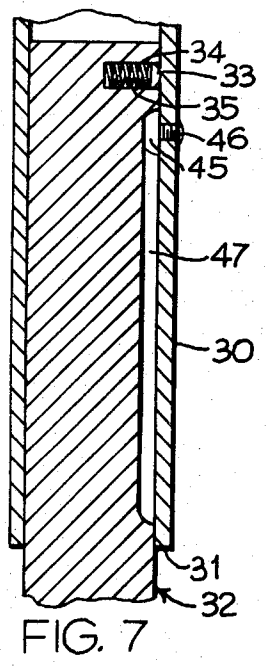


FIG. 7

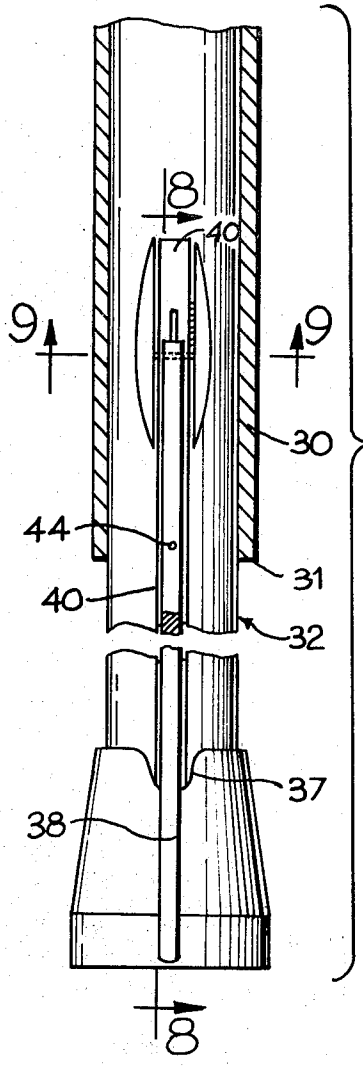
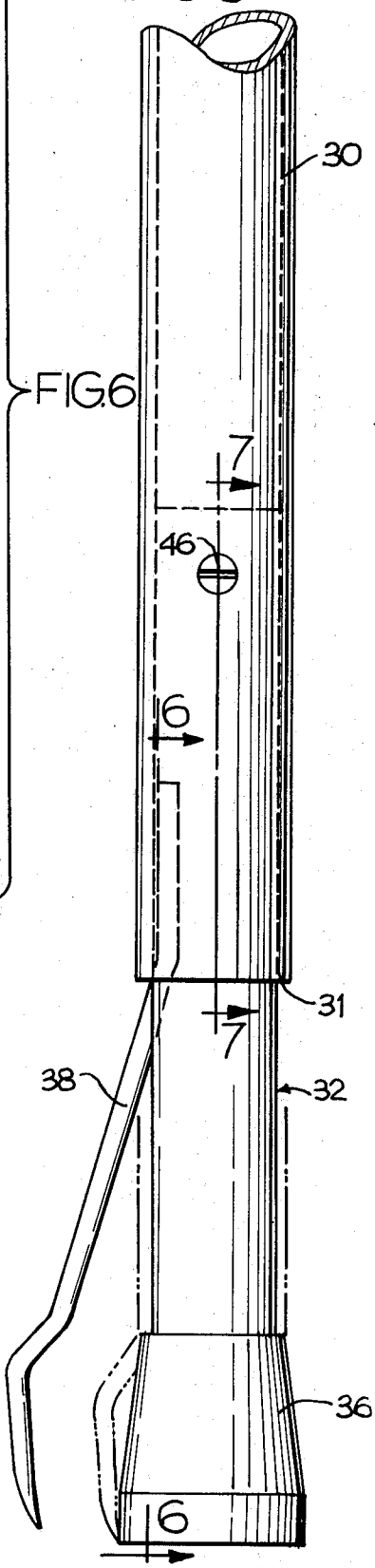


FIG. 6

FIG. 5



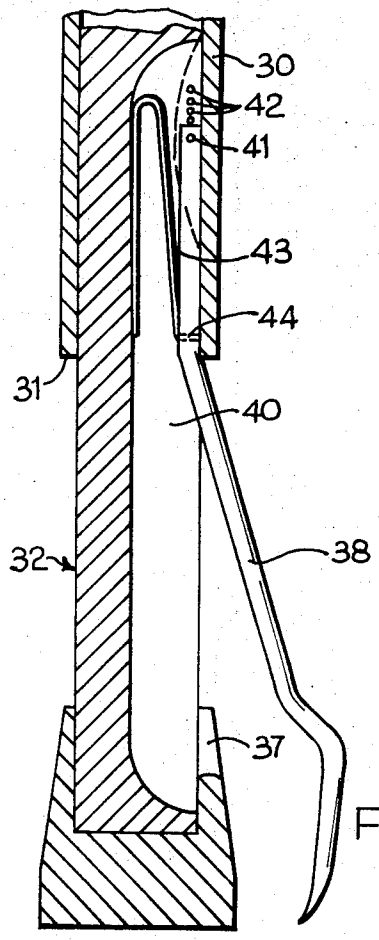


FIG 8

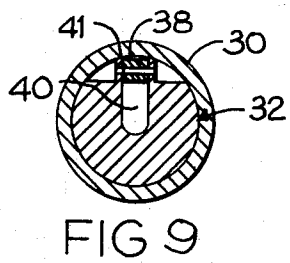


FIG 9

PICKUP DEVICE FOR WALKING CANE OR CRUTCH

BACKGROUND OF THE INVENTION

The present development arose from a recognition of the difficulty encountered by many handicapped persons in retrieving or picking up objects from the floor or other surfaces. This problem is particularly observable with respect to persons who have lost part or all of the functions of their legs, and who find it difficult or impossible to stoop or bend sufficiently to manually grab an object on the floor. Recognizing that many of these people use a cane or crutch to assist them in walking, a development effort was undertaken to arrive at a mechanical device mounted at the outer end of a cane or crutch to assist in picking up objects.

Further study has disclosed that many prior attempts have been made to provide such a device, but most have been both cumbersome and mechanically complicated. They have made use of an upper manual control to operate a clamp or hook at the lower end of a cane or crutch. This involves complete revision of the conventional cane or crutch structure, and addition of a rather complicated linkage to provide the necessary mechanical strength. Examples are shown in prior U.S. Pats. Nos. 1,905,076; 2,340,036 and 2,836,188.

In contrast, the present apparatus provides a device which can be mounted at the lower end of most hollow canes or crutches without basic modification or change of the remaining parts therof. The device is manually set for operation and readily grasps objects alongside the outer end of the cane or crutch in response to downward pressure. Objects are released by manually holding the outer ends of the cane or crutch and extending the telescoping parts provided according to the present disclosure. The device is mechanically simple and requires no special maintenance. All parts of it are readily replaceable if worn or accidentally damaged.

SUMMARY OF THE INVENTION

The device disclosed herein comprises a post that is complementary to the tubular lower end of a cane or crutch and which is slidably received within the cane or crutch for coaxial longitudinal movement in a telescoping fashion between a first position located substantially within the tube and a second position protruding substantially outward from the tube. One or more longitudinal fingers are mounted alongside the outer surface of the post and are received within longitudinal recesses in the post surface. The upper or inner end of each finger is fixed to the post and the free lower or outer end of the finger is biased radially outward from the post. The outer end of each finger moves radially relative to the post in response to longitudinal movement of the post relative to the cane or crutch.

It is a first object of this invention to provide a mechanically simple pickup device that can be adapted for mounting at the outer end of most conventional canes or crutches.

Another object of this invention is to provide an effective pickup device for a cane or crutch which does not require the use of a controlling linkage necessitating substantial redesign of the cane or crutch structure.

Another object of this invention is to provide an effective pickup device at the outer end of a cane or crutch, the device being operable by pressure applied to the cane or crutch itself along the main axis thereof.

Another object of this invention is to provide such a pickup device that can be easily repaired or partially replaced when necessary.

Another object of this invention is to provide such a pickup device that can be easily repaired or partially replaced when necessary.

Another object is to provide such a device which does not in any way detract from the normal use and operation of the cane or crutch.

These and further objects will be evident from the following disclosure, taken also with the accompanying drawings, which illustrate a preferred form of the invention. It is to be understood that this form is presented only by way of example and that many minor physical changes can be made in the device without deviating from the basic concepts involved.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view showing the outer end of a cane or crutch equipped with a first embodiment of the present invention, the device being illustrated in an extended condition;

FIG. 2 is a cross-sectional view taken along line 2—2 in FIG. 1;

FIG. 3 is a longitudinal sectional view through the outer end of the cane or crutch taken along line 3—3 in FIG. 2;

FIG. 4 is a perspective view of the outer end of the cane or crutch, at a reduced scale, illustrating use thereof in grasping an object;

FIG. 5 is an elevational view similar to FIG. 1, showing a second embodiment of the invention;

FIG. 6 is a fragmentary elevational view taken substantially along line 6—6 in FIG. 5;

FIG. 7 is a fragmentary sectional view taken along line 7—7 in FIG. 5;

FIG. 8 is a fragmentary sectional view taken along line 8—8 in FIG. 6; and

FIG. 9 is a cross-sectional view looking along line 9—9 in FIG. 6.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The general nature of the present device can be best understood from FIG. 4, which shows the base of a can or crutch equipped with the pickup device. A gripper in the form of a pair of yieldable fingers 16 is mounted to a post 12 coaxially telescoping within the lower end of a tube 10 that is the lower support of the cane or crutch. The fingers 16 are partially recessed within slots 17 formed along post 12 and slots 21 cut through an outer rubber tip 14. Fingers 16 are radially biased outward from post 12 so as to normally urge their outer ends radially apart from the post 12. The fingers 16 are permitted to extend radially outward when the post 12 is manually extended from the lower end of the tube 10. To grasp an object 24 on the floor or a similar horizontal surface, one first extends post 12 and then places the fingers 16 over objects 24, with post 12 laterally adjacent to the object 24. By manually exerting downward pressure on tube 10, the resulting force applied against the floor surface 25 will cause post 12 to retract within tube 10, progressively pulling fingers 16 toward tube 10 and grasping the object 24. After the object 24 has been clamped between the tip 14 and the outer ends of fingers 16, it can be manually lifted by means of the extension provided by the cane or crutch and

subsequently released by again manually pulling post 12 outward from tube 10.

The details of a first form of the device are seen in FIGS. 1, 2 and 3. Specifically, tube 10 is shown as a hollow tubular member, formed from suitable metals or other materials capable of withstanding the load to which the cane or crutch is subjected. Tube 10 is illustrated as having a constant circular cross-section, although its cross-sectional configuration can be other shapes of desired. It terminates at a transverse lower edge 11 which is illustrated as being perpendicular to the central longitudinal axis of tube 10. If the present device is mounted to an existing conventional cane or crutch, the preparation of tube 10 might involve the removal of about an inch of material at the lower end of the conventional tubular element.

Post 12 has an exterior cross-sectional configuration that is complementary to the interior cross-sectional configuration of tube 10. It should preferably present a slidable frictional fit for telescoping movement within the lower end of tube 10. Post 12 is also illustrated as being tubular, but may be solid if desired. The lower end of post 12 is provided with a circumferential shoulder 13 having an outer diameter equal to the outer diameter of tube 10. A frictional rubber tip 14 abuts the outer surface of shoulder 13 and is held in place over an outer bottom 15 formed integrally with post 12 (FIG. 3). The tip 14 is easily replaced to compensate for normal wear.

Two identical fingers 16 are illustrated as being mounted on post 12. It is to be understood that one or more fingers 16 can be utilized according to the concept of this disclosure. Each finger 16 is formed from spring wire having sufficient resiliency to normally bias the fingers 16 outwardly to the protruding position shown in FIG. 1. Fingers 16 are mounted within individual parallel longitudinal slots 17 formed along the outside surface of post 12. The shoulder 13 is similarly slotted, and extensions 21 aligned with slots 17 are formed through the corresponding side of rubber tip 14.

The upper end of each finger 16 is bent perpendicularly to the body of the finger 16 and received through a complementary aperture formed through the base of the respective slot 17. The engagement of the upper end 18 of finger 16 in each aperture fixes longitudinally its position relative to post 12. The outer or lower end of each finger 16 is bent inwardly to present a pronged configuration 20 that facilitates engagement of objects between fingers 16 and tip 14.

A retaining screw 22 is threadably engaged in an aperture formed through tube 10 at the side of the device opposite to finger 16. Screw 22 protrudes through a longitudinal slot 23 formed through the post 12. The lower end of slot 23 is in open communication with a perpendicular offset slot 26 used to longitudinally lock post 12 relative to tube 10 and to selectively prevent longitudinal movement of these elements relative to one another.

The length of slot 23 is such as to permit extension of post 12 outwardly beyond the lower edge 11 of tube 10 so as to allow fingers 16 to protrude radially from post 12 prior to grasping of an article. Extension of post 12 is accomplished manually by first turning post 12 about its axis to align screw 22 along the longitudinal slot 23 and subsequently pulling outwardly on post 12 to the desired amount of extension. The upper end of slot 23 is located so as to insure overlapping of tubes 10 along the upper portion of fingers 16 so as to always retain fingers 16 within the respective slots 17 and the apertures that receive their bent upper ends 18.

Following manual extension of post 12, the rubber tip 14 is placed adjacent to an object straddled by fingers 16, and pressure exerted downwardly on tube 10 will cause the post 12 to partially telescope back within tube 10. This movement results in progressive camming of fingers 16 by the lower edge 11 of tube 10, gradually pulling the prongs 20 toward tip 14 until the object is securely grasped between the frictional rubber tip 14 and fingers 16. The outward biasing forces of fingers 16 help to insure proper frictional engagement between post 12 and tube 10. When the object is grasped, the cane or crutch can be manipulated to lift the object or direct it to whatever location is desired, where it can be freed by manually pulling post 12 outward from the lower end of the tube 10.

For normal walking purposes, the post 12 is fully telescoped with tube 10, bringing shoulder 13 into abutment with the lower edge 11 of tube 10. The screw 22 is used to lock the post 12 in place by turning post 12 about its axis, bringing screw 22 into the offset slot 26. The usual support loads exerted on the cane or crutch are transmitted from the lower end of tube 10 to the shoulder 13 and tip 14. An effective lifting device is therefore provided at the lower end of the cane or crutch without sacrificing structural strength between the cane or crutch and its usual frictional tip.

A second embodiment of the device is illustrated in FIGS. 5 through 9. While it operates in substantially the same manner as the apparatus described above, it includes mechanical elements which differ slightly from those shown in FIGS. 1–4.

In this embodiment, the lower end of the cane or crutch is shown as a hollow cylindrical tube 30. It terminates at a transverse lower edge 31. A complementary cylindrical post 32 is slidably received within the lower end of tube 30. In addition to the slidable frictional fit, sliding frictional engagement is assured between the tube 30 and post 32 by a recessed ball 33 fitted within a socket 34 extending radially into the post 32. The ball 3 is biased outwardly by a compression spring 35 to retard longitudinal movement of post 32 within tube 30. The frictional resistance to post movement can be varied by proper selection and loading of spring 35.

The lower end of post 32 is fitted with a conventional tip 36 of rubber or other suitable material for walking support purposes. As can be seen in the drawings, the tip 36 is preferably recessed at 37 to accommodate the particular shape of the gripper element.

The gripper is shown as being a single rigid finger 38 bent so as to project inwardly toward tip 36 at its lower end. The finger 38 is pivotally mounted to the post 32 within a longitudinal slot 40, the pivot pin being shown at 41. A number of alternate apertures 42 can be provided in post 32 to permit adjustment of the position of finger 38 as desired by a particular user.

Finger 38 is biased outwardly from post 32 by a hairpin-shaped spring 43 received at one end through an aperture 44 formed through finger 38. Spring 43 is a compression spring bearing against the base of slot 40 and against finger 38 to normally bias finger 38 radially outward relative to the longitudinal center axis of post 32.

To provide an effective limit to longitudinal movement of post **32** relative to tube **30**, a small slide **45** is fixed within tube **30** by a bolt **46**. Slide **45** is received within a longitudinal slot **47** formed along the exterior surface of post **32**. The length of slot **47** defines the operating limits of movement of post **32** relative to tube **30**.

The general operation of this embodiment is basically the same as previously described. The finger **38** is extended automatically upon extension of post **32** and retracted by compression force being exerted on tube **30** against a surface engaged by the tip **36**. By placing tip **36** adjacent to an article to be gripped, the finger **38** can be forced toward the article to securely engage it between the outer end of finger **38** and the frictional surfaces of tip **36**. The lower or outer end of finger **38** can have a slight transverse concave configuration to further aid in gripping an article. Because the tip **36** can be substantially rigid, greater force can be exerted to grip an article than is possible with spring fingers as previously disclosed with respect to the first embodiment of this invention.

Further modifications are possible with respect to the basic structure of this disclosure. Where two fingers are used as the gripper, a connecting web at their ends might be provided to present a wide lateral surface to grip articles. In the case of a single finger, laterally extended plates might project to each side of the finger to again present a greater surface area to grasp an article. Obviously, greater numbers of fingers can be used if this is desired.

Having thus described my invention, I claim:

1. A crutch or cane, comprising:

a hollow upright tube having a center longitudinal axis and an open lower end defined by a transverse edge;

means on the tube for manually supporting the user in the manner of a crutch or cane;

a coaxial post complementary to the tube interior configuration and slidably mounted therein at the lower end of the tube in a telescoping fashion for longitudinal movement relative to the tube between a first position substantially recessed within the tube and a second position protruding substantially downward from the tube;

upright finger means mounted to the post and extending longitudinally alongside said post, the upper end of said finger means being mounted to the post and the lower end thereof being biased outward from the post axis;

the lower end of said finger means being movable toward or away from said post in response to longitudinal movement of the post between its first and second positions.

2. The device set out in claim **1** wherein said finger means are recessed within the exterior surfaces of said post in positions flush with the post surfaces when the post is in said first position.

3. The device set out in claim **1** wherein the post has a frictional rubber tip at its outer end, said finger means longitudinally overlapping a portion of the rubber tip.

4. The device as set out in claim **1** further comprising motion limiting means connected between the tube and post and defining the limit of movement of the post relative to the tube at said first and second position.

5. The device set out in claim **1** wherein said finger means is in the form of a length of spring wire bent radially outward relative to the post from the inner end of the wire to its outer end, the inner end of the wire being directed radially inward relative to the post and received through a complementary radial aperture formed in the post.

6. The device set out in claim **1** wherein said finger means is in the form of a rigid elongated finger movably received within a longitudinal slot formed along the outer surface of the post, the inner end of the finger being pivotally connected to the post about a transverse axis;

and spring means between the post and finger yieldably urging the outer end of the finger radially outward from the post.

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