Title of the Invention: Hand and armpit support stair climbing aid

Abstract Title: Hand and armpit support stair rail

The rail assembly comprises a handrail 1; a plurality of cantilever arms 2; and a mounting board 4; wherein the cantilever arms are each pivotally attached to the base plate at a first end and are each secured to the underside of the handrail at an opposing end such that the rail assembly is configurable between a folded out position and a retracted position. The rail assembly may include a locking pin 6. A screw adjuster 5 may be located on each cantilever arm to align consecutive rail assemblies with one another. Channels 3 may provide the pivotal attachment between the cantilever arms and the base plate. The cantilever arms may be telescopically extendable. The rail assembly may be mounted with similar assemblies on opposed stairway walls or balustrades in successive pairs to provide underarm support to elderly or infirm persons, thereby aiding their ascent or descent along the stairway.
Hand & Armpit Support Stair Climbing Aid

FIELD OF THE INVENTION:

The present invention relates to a stair climbing aid for patients with leg injuries. The higher rail gives hand & armpit support for greater safety and interference free passage from the cantilevered design. Fold back features allow for normal traffic when “not in use” and a telescopic strut option permits adjustment of height & width between support rails to cater for changes in stance of a rehabilitating patient.

Definitions in this Citation:

“Balustrade” - A generic name proposed by applicant to allude to a stair banister rail.
“Balusters” - Upright posts & boards supporting staircase handrail.

PROBLEM, NEAREST PATENTS & PRESENT STATE OF THE ART:

According to the Royal Society for the Prevention of Accidents statistics, 60% of older persons’ deaths in homes result from accidents on staircases. The problem with nearest patented stair climbing aid inventions is that the rail is at a low height, intended for hand grip use only, which gives insufficient support and confidence to impaired mobility users. Furthermore, they use tie rods causing interference with the smooth passage of the user when climbing up the stairs. Tie rods also increase the cost of stair climbing aids.

SOLUTION & OBJECT OF PRESENT INVENTION.

The object of the present invention is to overcome above problems by providing a dual, retractable, interference free, hand & armpit height support, inexpensive stair climbing aid, supplied in dual set assemblies of armpit rail & three cantilevered struts pivotally linked to channel supports on a mounting board, for consecutive installation on walls and balusters of stairs. The high support rail doubles as hand and armpit support - fig. 1. This increases safety for impaired mobility users. The adjustable telescopic struts option allow for quick adjustment of height & width between rails, useful when changes are needed by rehabilitating leg injury patients getting better and standing more erect.
**Patent Searches - No Anticipations:**

At filing, a *Worldwide Patent Database Search* on esp@cenet website showed *no prior art* for a retractable, hand & armpit support stair climbing aid, interference free due to fastening on underside to cantilevered struts linked to pivot means.

**Novelty Step differences** with nearest "*Prior Art*" patents listed below:-

**US 202/005513A1** – (BERNER) – see figs. 1, 2 & 4.

**US 4939876 A1** – (BERNER) – see figs. 1, 3A & 3B.

**DE 19 522337 A1** – (HOELZER) – see all figs.

**JP 07011749A** – (TSUKASA) – see EPODOC abstract and all figs.

All the above differ significantly in inventive step because they embody:-

A rail for hand support only – present invention rail provides hand & armpit support.

Tie rods used give interference to user - present invention embodying cantilevered struts provide "interference free" passage climbing up & down stairs.

**SUMMARY OF INVENTION:**

A hand & armpit support stair climbing aid, comprising a support rail, fastened on underside to cantilevered struts, linked to pivot support channels, attached to a mounting board for fastening to stair walls & balusters; the struts have stops to hold them in the angled out “in use mode”, ball catches to hold them in the retracted “non use mode” and a telescopic strut option for adjustment of height & width between support rails to cater for changes in the stance of a rehabilitating patient.

**USES & ADVANTAGES:**

1. A stair climbing aid for use & rehabilitation of patients with leg injuries.
2. Gives greater confidence & safety as higher rail gives hand & armpit support.
3. Gives interference free passage from cantilevered struts attached to underside of rail.
4. Easy installation on stairways with short consecutive assembly sets.
5. Fold back retractable feature allows for normal traffic when not in use.
6. Telescopic strut option adjusts height & width between rails to suit stance of user.
REFERENCE TO DRAWINGS:

Figure 1 illustrates a person using the first of two pairs of stair climbing aid units installed consecutively on wall (not shown) & baluster of staircase; the units show the optional telescopic struts which allow for altering height & width between rails, as needed by leg injury patients to cater for changes in their stance.

Figure 2 is an illustration of a basic retractable, stair climbing aid assembly unit comprising armpit rail fixed length struts, linked to pivot support channels, fixed on the mounting board, shown in the "in use mode".

Figure 3 is the same Stair Climbing Aid assembly unit as in fig 2, shown in the retracted "not in use mode".

Figure 4 is an illustration of the Stair Climbing Aid assembly unit embodying the optional adjustable telescopic struts shown in the "in use mode".

Figure 5 is the same Stair Climbing Aid assembly unit embodying the optional adjustable telescopic struts as in fig 4, shown in the retracted "not in use mode".

Figure 6 details the stair Climbing Aid in the "in use mode", illustrating the optional telescopic strut assembly, installed on a staircase with stair wall not shown for clarity.
DESCRIPTION

1. Referring to the drawings, the present invention – “Hand & Armpit Support Stair Climbing Aid”, supplied in dual set assemblies each comprise a support rail, 1, fastened on underside to a plurality of cantilevered strut means, 2, linked to pivot support means, 3, & 3sc, fixed on a mounting board, 4, with holes, 4h, for fastening to stair walls & balusters; the struts, 2, embody adjustable stop means, 6, to hold strut in the angled out “in use mode”, and catch means, 7bc, to hold struts in the retracted “not in use mode”; optionally the struts embody adjustable telescopic means, 2t & 2ts, to adjust height and width between rails.

2. The plurality of cantilevered struts, 2, is preferably three struts per armpit rail, 1, fastened in assembly pairs consecutively on stair walls & balusters.

3. The armpit support rail, 1, & struts, 2, materials include wood & metal, the support rail, 1, is preferably round in section, with a flat underside; and the struts, 2, are preferably square in section.

4. The pivot support means comprises thro hole, 2p, in strut, 2, linked by pin means (typically bolt, 3b, & nut, 3n), fitted in holes provided in sides of (preferably steel) channel, 3sc, secured to the mounting board, 4, with fasteners & attachment means.

5. The adjustable stop means comprises preferably a screw adjuster, 6, & lock nut, 6n, fitted in a threaded hole, embodied in each strut, 2, beneath the pin means, the catch means is preferably a ball catch, 7bc, embedded in strut, 2, with the striker catch hole, 7ch, embodied on the steel channel, 3sc.

6. The optional adjustable telescopic struts comprise a strut, 2t, sliding inside a telescopic sleeve, 2ts, both embodying a plurality of matching spaced apart thro holes, 2sh & 2tsh, secured by a bolt, 2th, & nut, 2tn, inserted through specific selected holes, 2sh & 2tsh, so provided to alter height & width between support rails to cater for changing stance of user, 8.
CLAIMS:

1. A hand & armpit support stair climbing aid supplied in dual set assemblies, each comprising a support rail fastened on underside to a plurality of cantilevered strut means, linked to pivot support means, fixed on a mounting board with holes for fastening to stair walls & balusters; the struts have adjustable stop means to hold struts in angled out “in user mode”, and catch means to hold struts in retracted “not in use mode;” optionally the struts embody adjustable telescopic means.

2. A hand & armpit support stair climbing aid as in claim 1, wherein said plurality of cantilevered struts is preferably three struts per armpit rail, fastened in assembly pairs consecutively on stair walls & balusters.

3. A hand & armpit support stair climbing aid as in claim 2, wherein said rail & struts material includes wood & metal; said rail is preferably round in section, with flat underside; the struts are preferably square in section.

4. A hand & armpit support stair climbing aid as in claim 3, wherein the pivot support means comprises a thro hole in strut provided with pin means (typically bolt & nut), fitted in holes in sides of a (preferably steel) channel, said channel secured to said mounting board with fasteners & attachment means.

5. A hand & armpit support stair climbing aid as in claim 4, wherein adjustable stop means comprises preferably an adjuster screw & lock nut fitted in a threaded hole embodied in each strut beneath said pin; the catch means is preferably a ball catch embedded in strut with striker catch hole provided on side of said channel.

6. A hand & armpit support stair climbing aid as in claim 5, wherein said optional telescopic adjustable struts typically comprise a strut sliding inside a telescopic sleeve, both embodying a plurality of matching spaced apart thro holes secured by a bolt & nut, so provided to alter height & width between support rails to cater for changing stance of user.
Application No: GB1100030.4  Examiner: Eleanor Wade
Claims searched: 1 to 6  Date of search: 18 February 2011

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

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Categories:

- X Document indicating lack of novelty or inventive step
- Y Document indicating lack of inventive step if combined with one or more other documents of same category.
- & Member of the same patent family
- A Document indicating technological background and/or state of the art.
- P Document published on or after the declared priority date but before the filing date of this invention.
- E Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC:

Worldwide search of patent documents classified in the following areas of the IPC
A61H; E04F

The following online and other databases have been used in the preparation of this search report
EPODOC, WPI

International Classification:

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