

⑫

EUROPEAN PATENT APPLICATION

⑲ Application number: **78300196.9**

⑥ Int. Cl.²: **A 61 H 3/02**

⑳ Date of filing: **25.07.78**

⑳ Priority: **28.07.77 JP 101380/77**

㉑ Date of publication of application:
07.02.79 Bulletin 79/3

㉒ Designated contracting states:
BE CH DE FR GB LU NL SE

㉓ Applicant: **Nakajima, Kotaro**
7, Junikencho Higashi-ku
Osaka. (JP)

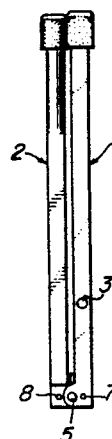
㉔ Inventor: **Nakajima, Kotaro**
7, Junikencho Higashi-ku
Osaka. (JP)

㉕ Representative: **Kearney, Kevin David Nicholas et al**
KILBURN & STRODE
30 John Street
London, WC1N 2DD. (GB)

㉖ **A foldable crutch**

㉗ The invention provides a foldable crutch having an upper portion (1) and a lower portion (2) of substantially equal lengths, connecting means (5) adapted for pivotally connecting the adjacent ends of the upper and lower portions, and a locking mechanism adapted to hold the upper and lower portions in the linearly stretched state against the pivotal movement.

FIG. 3



EP 0 000 660 A1

A FOLDABLE CRUTCH

The present invention relates to a crutch.

For those who are handicapped in their lower limbs, the crutch is a vital and indispensable instrument which they cannot leave even for a moment in their daily lives.

The most serious problem common to all crutched persons resides in the trouble concerning the disposal or storage of the crutch when it is not used, rather than the difficulty in the handling of the same for the walking or the like purposes.

Unfortunately, the modern society is leaning to exclude the crutches in its all aspects. Thus, the crutches are becoming hardly accepted.

Accordingly the present invention provides a crutch comprising an elongated upper portion (1), an elongated lower portion (2), connecting means for pivotally connecting the adjacent ends of said upper and lower portions to each other, and locking means (10) adapted to lock said upper and lower portion against pivotal movement, in such a stretched state that said lower portion is linearly extended from said upper portion.

It is therefore an advantage of the invention that a crutch is provided which can conveniently be folded into a short length when not in use.

It is another feature of the invention to provide a crutch having an upper and a lower portions which are pivotally secured to each other for a 180° rotation.

It is still another feature of the invention to provide a crutch having a mechanism for locking the upper and lower portions against the relative pivotal

movement when the crutch is to be presented for use.

It is a further feature of the invention to provide a crutch having a locking mechanism which can be handled without difficulty.

5 These and other objects, as well as advantageous features of the invention, will become more clear from the following description of preferred embodiments taken in conjunction with the accompanying drawings in which:

10 Figure 1 is a front elevational view of a crutch in accordance with the invention,

Figure 2 is a side elevational view of the crutch as shown in Figure 1,

Figure 3 is a side elevational view of the crutch in the folded state,

15 Figure 4 is a front elevational view of the crutch in the folded state,

20 Figure 5 is an enlarged perspective view of the crutch in the locked state, specifically showing the connecting portion of the upper and lower parts of the crutch,

Figure 6 is an enlarged perspective view of the crutch in the unlocked and slightly folded state, specifically showing the same portion as that shown in Figure 5,

25 Figure 7 is an enlarged perspective view of the connecting portion with the constituents of the locking mechanism removed,

30 Figure 8 is an exploded perspective view of the locking mechanism, showing the constituents of the same, and

Figure 9 is a sectional view taken along the line IX-IX of Figure 5.

Referring to the drawings, a crutch embodying the present invention has an upper portion 1 and a lower portion 2 of substantially equal lengths. The upper portion 1 is provided with a handle or a hand-retaining bar 3. The lower end of the upper portion 1 has a pair of forked or U-shaped portions 1a. Each U-shaped portion 1a has a groove 1b extending in the longitudinal direction of the upper portion 1 and at a right angle to the breadthwise direction of the latter.

On the other hand, the lower portion 2 is provided with a pair of projections 2a formed on its upper end. These projections 2a are received by the grooves 1b of corresponding U-shaped portions 1a.

As will be seen most clearly from Figure 7, the U-shaped portion 1a and the projection 2 have lateral extensions which are shown, in Figure 7, to project downwardly from the upper and lower portions 1, 2. Mutually aligned through bores 4 are formed in these lateral extensions of the U-shaped portions 1a and the projections 2a.

The common axis X-X of the through bores 4 extends in the breadthwise direction of the crutch and at a right angle to the longitudinal axis of the crutch.

As will be seen from Figure 2, the centre X of the through bore 4 is slightly deviated outwardly from the side edges 1c, 2c of the upper and lower portions 1, 2 of the crutch.

The upper portion 1 and the lower portion 2 are

pivotally connected to each other through a rod 5 which is inserted into the through bores 4. Thus, the lower portion 2 can be swung by 180° around the axis of the rod 5, from the folded position as shown in Figures 3, 4 in which it extends in parallel with the upper portion 1 to the stretched position as shown in Figures 1, 2 in which it is linearly extended from the upper portion 1.

The arrangement is such that the ends 1d of each U-shaped portion 1a abut shoulders 2d formed at both sides of each projection 2a, when the lower portion 2 is rotated by 180° into the stretched position, thereby to prevent the lower portion 2 from being further rotated beyond 180° . It is also possible to prevent the rotation of the lower portion 2 beyond 180° .

These locking bores are arranged so that they are brought into alignment with each other when the lower portion 2 is in the stretched position.

Guide pipes 9 are fixed to the opposing surfaces of two U-shaped portions 1a, 1a, in axial alignment with respective locking bores 7. Each guide pipe 9 slidably holds a locking pin 10. Each locking pin 10 is fixed to an operation plate 11. These operation plates 11 are fixed to respective pipes 12 which are slidable along

the rod 5. A collar 13 is fixed by suitable means to the centre of the rod 5. A coiled spring 14 is disposed on each side of the collar 13. These coiled springs 14 are adapted to bias respective operation plates toward the corresponding U-shaped portions 1a, so as to drive the locking pins into the locking bores 7, 8. Two operation plates 11, 11 are spaced apart from each other by such a distance that these operation plates can easily be brought together by fingers of single hand.

In use, the lower portion 2 of the crutch in accordance with the invention is locked at the stretched position as shown in Figures 1 and 2, with the locking pins 10 received by corresponding locking bores as shown in Figure 5.

For folding the crutch, two operation plates 11, 11 are brought together by fingers as shown in Figure 6, so that the locking pins 10, 10 may be disengaged at least from the locking bores 8, 8. Then, the lower portion 2 is simply pivoted with respect to the upper portion 1 to the folded position as shown in Figures 3, 4.

Since the length of the crutch is reduced to half by the folding, the crutch in the folded state can be handled quite easily and can conveniently be stored even in an extremely limited space.

Further, the folded crutch can support itself and, therefore, can conveniently be used as a temporary stool, by flattening the lower end of the crutch in the folded state as shown in Figure 3.

0000660

6.

Thus it can be seen that the invention provides a crutch which can be readily manufactured and which will serve a useful purpose for those people who have need of a crutch.

CLAIMS:

1. A crutch comprising: an elongated upper portion (1); an elongated lower portion (2); connecting means for pivotally connecting the adjacent ends of said upper and lower portions to each other; and locking means (10) adapted to lock said upper and lower portions against pivotal movement, in such a stretched state that said lower portion is linearly extended from said upper portion.
2. A crutch as claimed in Claim 1, wherein said upper and lower portions have substantially equal lengths.
3. A crutch as claimed in Claim 1 or 2, wherein said connecting means has a pivot axis around which said upper and lower portions are pivoted in relation to each other, said pivot axis extending substantially in the breadth-wise direction of said crutch and substantially at a right angle to the longitudinal axis of said crutch.
4. A crutch as claimed in Claim 1, 2 or 3 including stop means (1d, 2d) adapted to prevent said upper portion from being rotated beyond 180° around said pivot axis in relation to said lower portion.
5. A crutch as claimed in Claim 1, 2, 3 or 4 wherein said connecting means comprises a pair of U-shaped portions (1a) formed at the end of either one of said upper and lower portions, a pair of projections (2a) formed at

the end of the other of said upper and lower portions, said projections each being received between the legs of a respective one of the U-shaped portions, there being aligned pivot bores formed through said U-shaped portions and said projections, and a pivot rod (5) extending through each of said through bores.

6. A crutch as claimed in Claim 5, wherein said locking means comprises a first locking bore formed in at least one of said U-shaped portions (1a), a second locking bore formed in the respective one of said projections (2a) and a locking pin (10) arranged to be inserted in said first and second locking bores.

7. A crutch as claimed in Claim 6, wherein said locking means comprises a locking bore formed in each of said U-shaped portions (1a), a second locking bore formed in the respective projections (2a), and a pair of locking pins (10) each of which is adapted to be inserted into a respective one of said first locking bores and associated second locking bores.

8. A crutch as claimed in Claim 7 wherein said locking means comprises a pair of operating plates (11) slidably mounted on said pivot rod (5), between said pair of said U-shaped portions (1a), each operating plate (11) being rigidly connected to a respective one of said locking pins (10).

9. A crutch as claimed in Claim 7 or 8, wherein said

locking means comprises a pair of guides (9) secured on the opposing surfaces of said pair of said U-shaped portions (1a) in axial alignment with said locking bores to guide the respective locking pins (10).

10. A crutch as claimed in Claim 8 or 9, wherein each said locking pin (10) is provided with means (14) biasing it into its associated locking bores.

11. A crutch as claimed in Claim 10, wherein said biasing means (14) is operable on the respective rod (10) by way of its operating plate (11).

12. A crutch as claimed in Claim 10 or 11, wherein said biasing means includes a collar (13) secured on said pivot rod (5) between said operating plates (11) and a pair of coiled springs (14) each disposed between said collar (13) and one of said operating plates (11).

FIG. 1

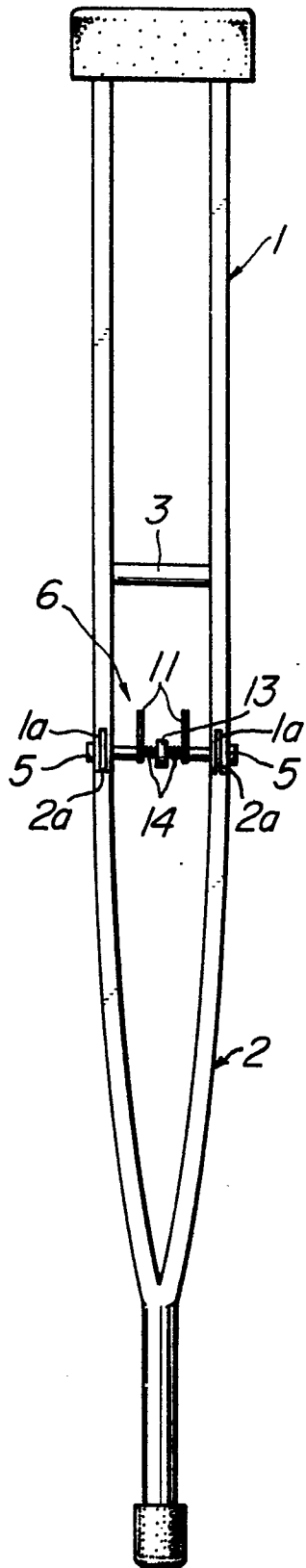


FIG. 2

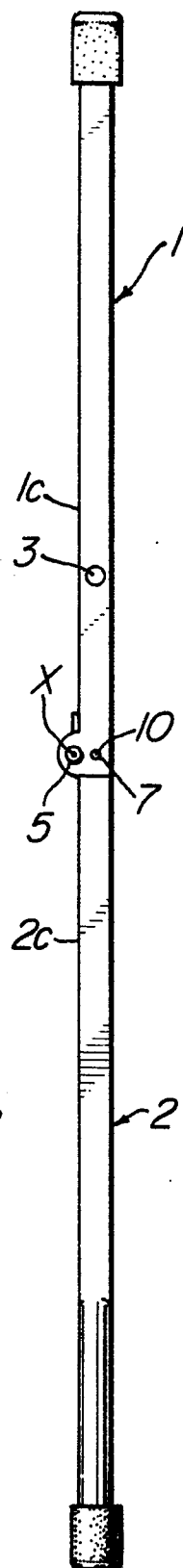


FIG. 3

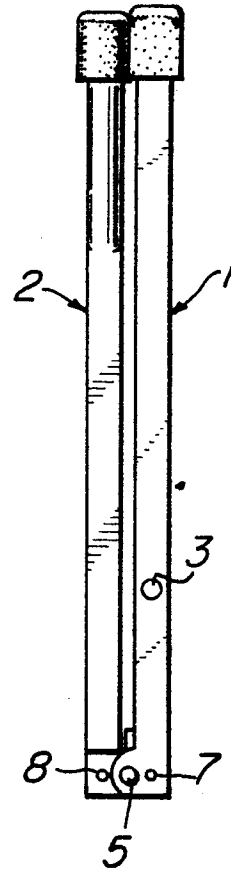
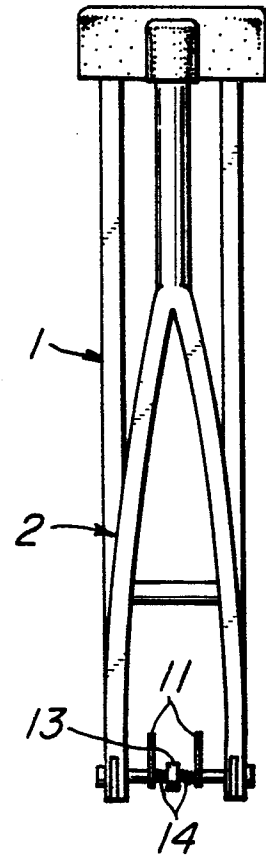


FIG. 4



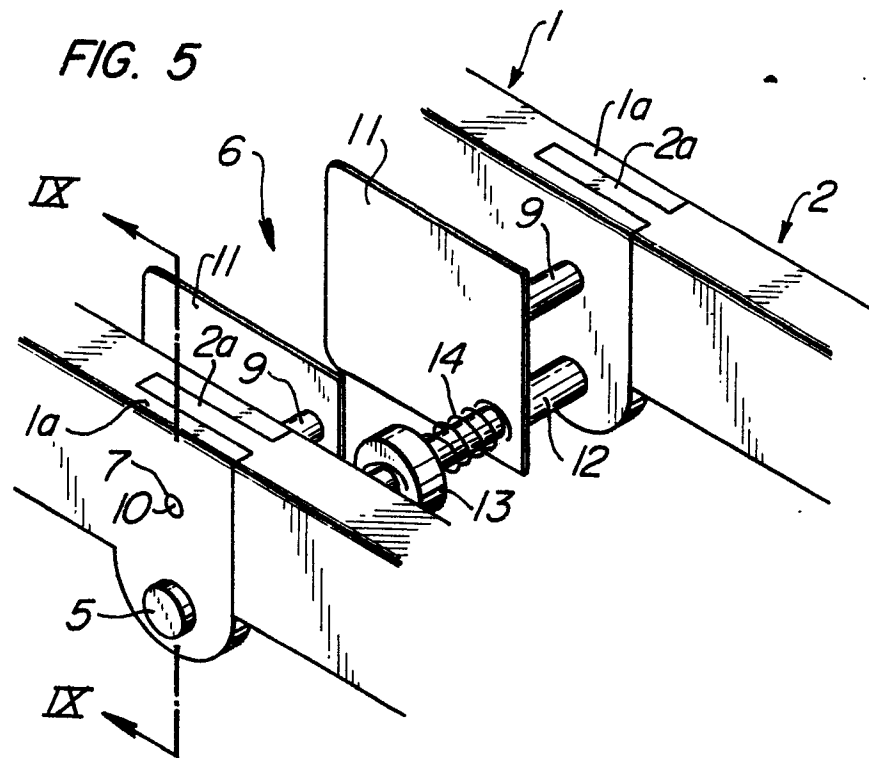


FIG. 6

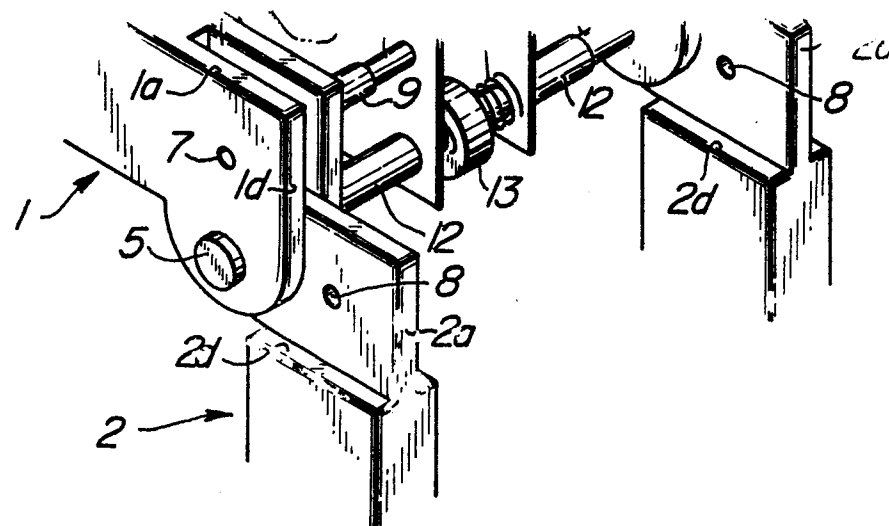


FIG. 7

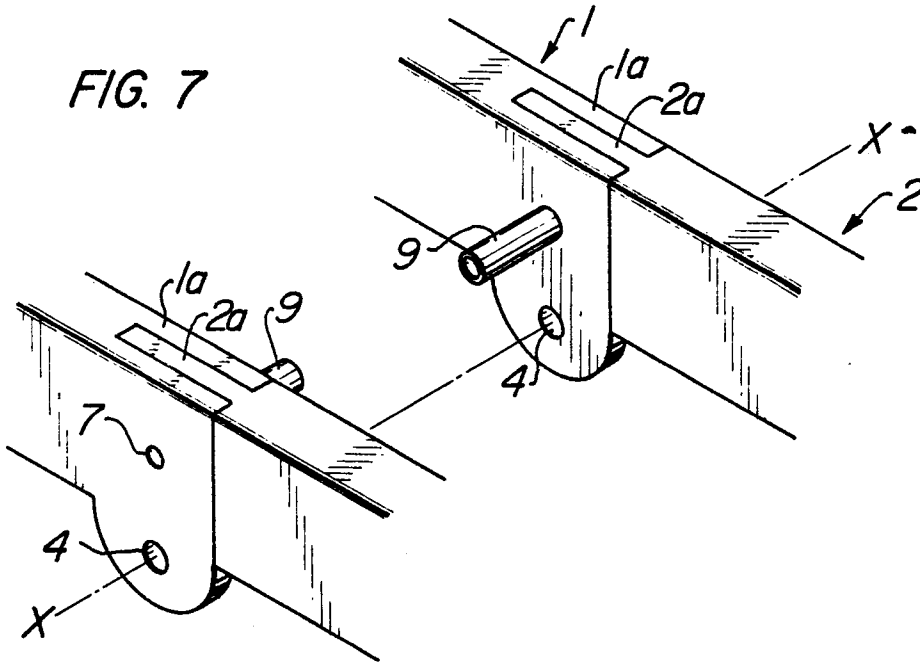


FIG. 8

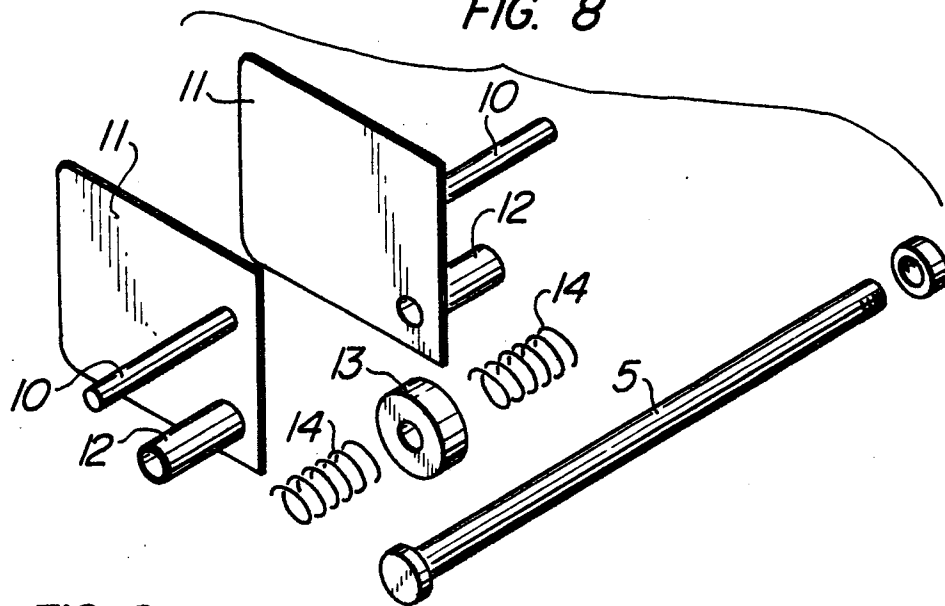
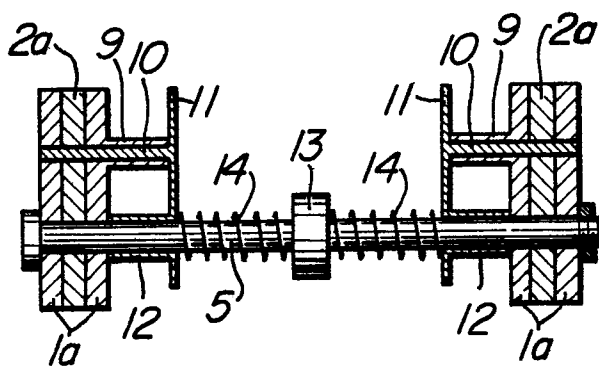


FIG. 9





European Patent
Office

EUROPEAN SEARCH REPORT

0000660

Application number

EP 78 30 0196

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
	<u>US - A - 2 490 380 (O.SCHWEPPEN-HEISER)</u> * The figures; column 2, lines 15-31 * --- <u>US - A - 3 492 999 (Z.BOYD)</u> * The figures; column 2, lines 8-10, 28-63 * --- <u>US - A - 3 886 962 (D.DIAMONTIS)</u> * Figures 2-6; column 3, line 61 - column 4, line 7; column 4, lines 25-29 * --- <u>US - A - 1 945 460 (E.WILLIS)</u> * Figures and text * --- <u>US - A - 2 484 406 (H.GIBSON)</u> * Figures 1,2; column 1, line 53 - column 2, line 47 * --- <u>US - A - 2 788 793 (CH. ABBOTT)</u> * Figures 1-5; column 2, lines 8-57 * -----	1-3, 5-12 1-6,10 1-5 1-4 1-7 1-4	A 61 H 3/02 TECHNICAL FIELDS SEARCHED (Int.Cl.⁷) A 61 H 3/02 CATEGORY OF CITED DOCUMENTS X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons &: member of the same patent family, corresponding document
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
The Hague	3-11-1978	VEREECKE	