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(56) Documents Cited
EP 0074007 A2 **US 5588220 A**
US 4067513 A **US 3436032 A**
US 3381916 A

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(54) Abstract Title
A tape measure housing with inter-engaging first and second parts

(57) A tape measure housing with inter-engaging first and second parts comprises a first part 1 having at least one lipped-lug 4/4' and a second part 11 having a retainer 14/14' for forming a retaining engagement, each part further comprising an outer wall 3/13 wherein the outer walls come together upon the formation of the retaining engagement, at least one of the lug and retainer pairings being spaced from the outer wall of their respective parts. The spacing may be such that the internal volume of the housing is substantially unimpeded. The retainer may include an upstanding element spaced so as to define a gap between the outer wall and the element which may further comprise a window, recess, overhang or the like for engaging the lip of the lug. The outer wall of either of the parts may further comprise a locating channel 6, the other part being provided with a guide 23 which is receivable therein. The housing may be provided with an opening 20/8 to allow measuring tape to be extended from and retracted into the housing, said first and second part being provided respectively with a lipped-lug and a retainer adjacent to the opening. The housing may be formed from an injection-moulded plastics material.

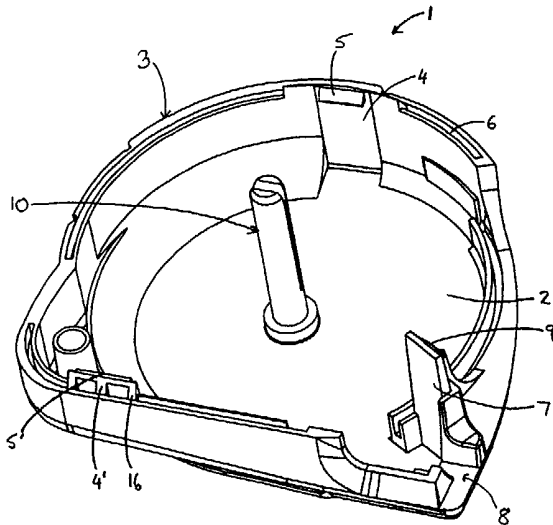


Figure 1

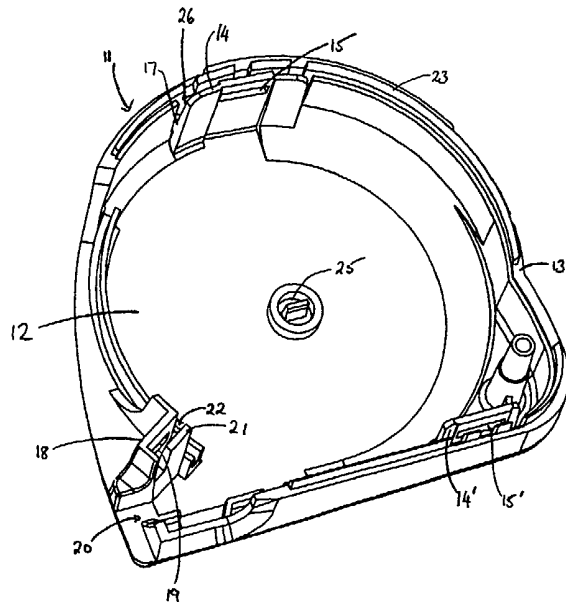


Figure 2

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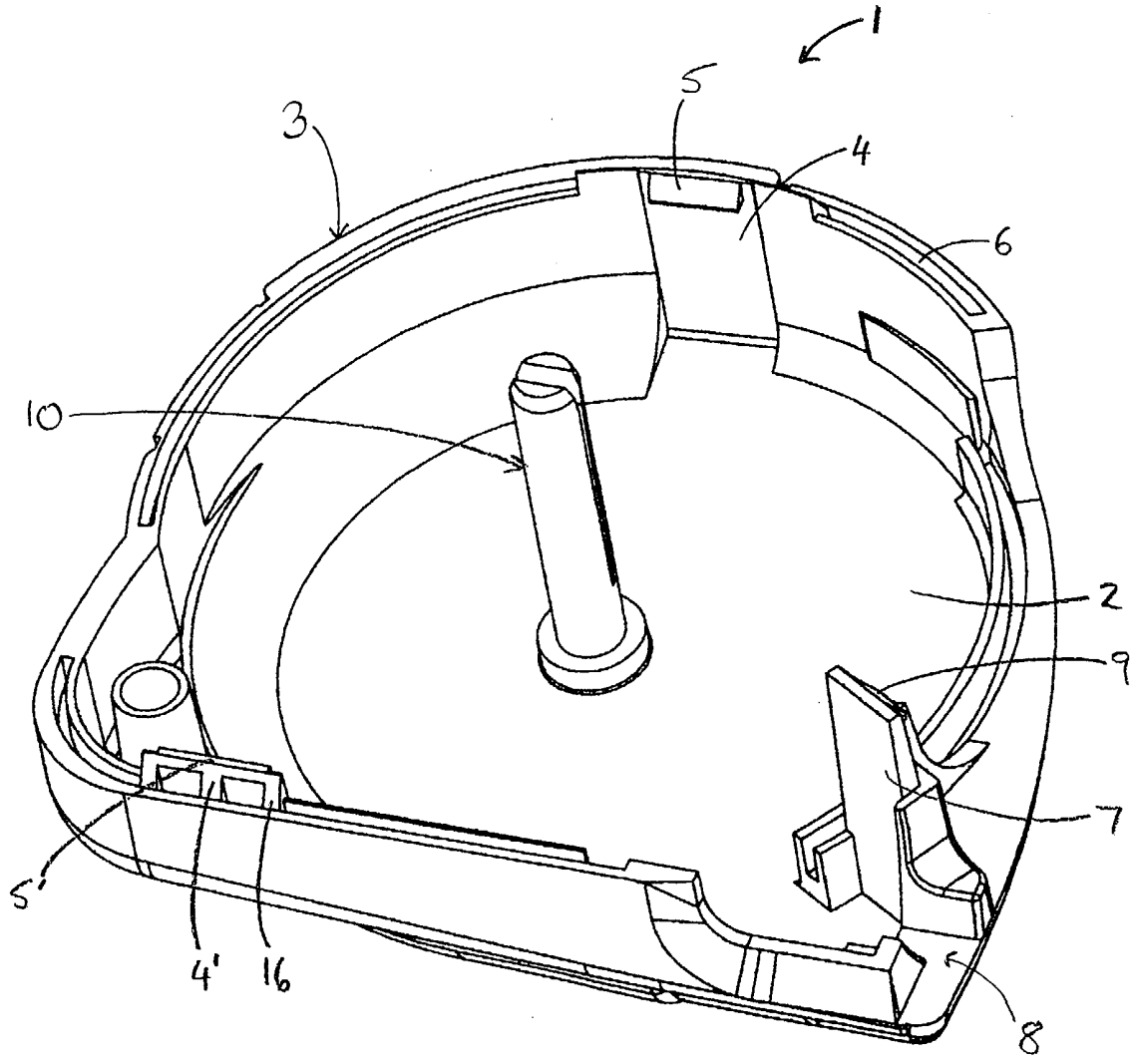


Figure 1

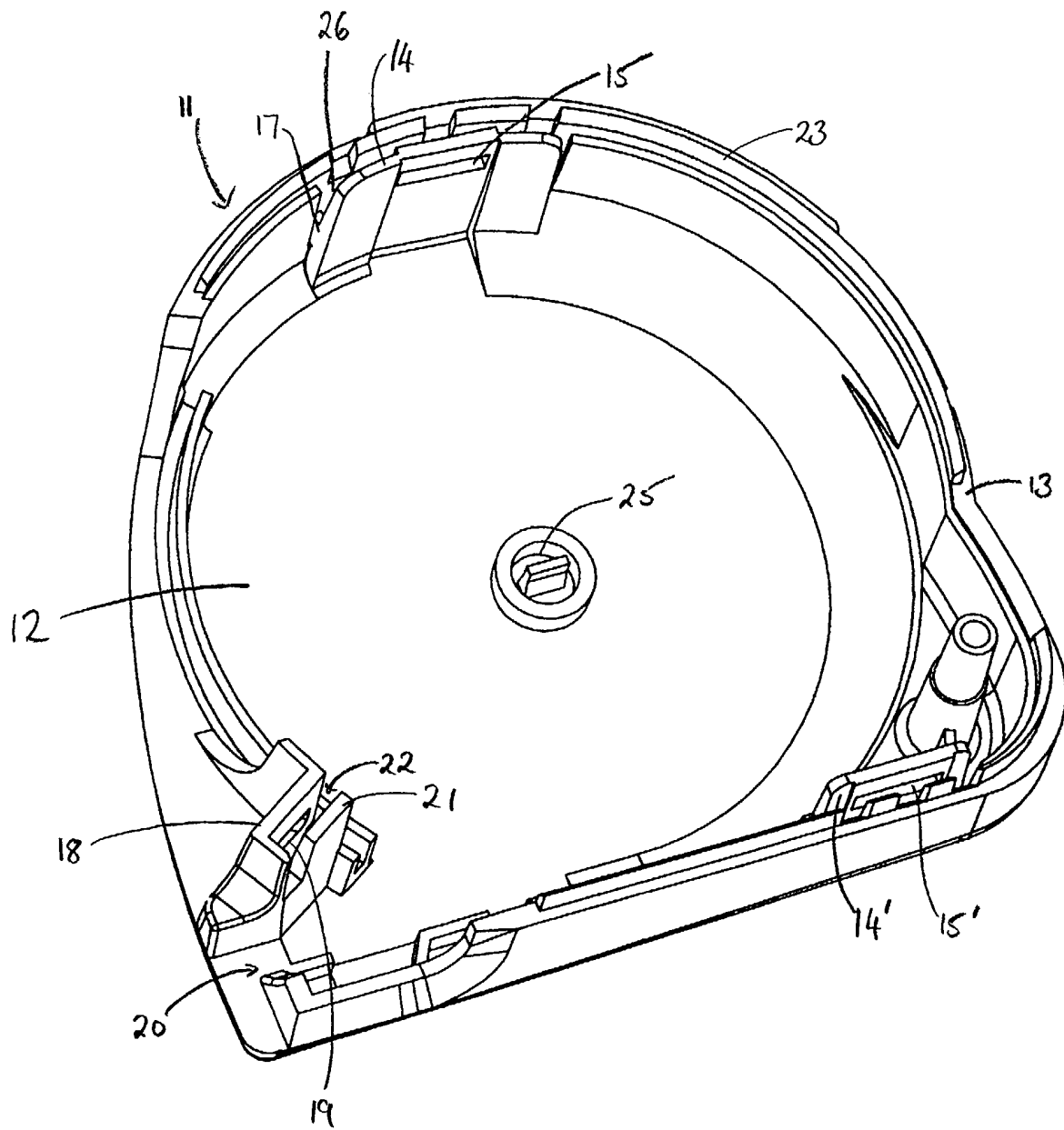


Figure 2

Housing

This invention relates to a housing for a tape measure and a tape measure including such a housing. In particular, this invention relates to two-part click-fit
5 housing for a flexible, retractable tape measure.

It is known to provide flexible tape measure wound onto a spindle such that the tape measure can be unwound from the spindle for use and then retracted after use for convenient storage. The spindle is usually formed on or
10 connected to the inside of a housing that encloses the wound tape measure. This housing is usually formed in two parts, one part bearing the spindle onto which the tape measure is wound and the second part coordinating with the first part to enclose tape measure, the complete
15 housing having an opening through which the tape measure can be extended and retracted.

There are various known methods for connecting the first and second parts of the housing together.

Sonic welding has been used to connect the two parts
20 but this method is restricted to a limited range of plastics material and is unsuitable for housings having a chrome plated finish.

It is also known to use screws to connect the two parts but this is a time consuming method and adds extra

cost to the production of the housings as extra components, i.e. screws, are required.

A further known method of connecting the two parts is by "click-fitting" in which one part of the housing has a number of upstanding, lipped lugs extending from its outer wall. The other part has recesses or overhangs formed in its outer wall which cooperate with the lugs, the outwardly-facing lip of the lug being engaged in the recess or under the overhang. In order to achieve this engagement the two parts are simply pushed together, each lug being slightly resiliently deformable.

The problem with this known method is that, because the engagement between the lugs and recess/overhangs occurs at the walls of the housing, any flexing of the walls, e.g. in the event of the housing being dropped, can break the engagement such that the two parts separate from one another. For this reason, housings having two parts connected in a click-fit manner often use screws to reinforce the connection. As explained above, the use of screws increases the number of components of the housing and thus increases cost and production time.

The present invention aims to provide a two part housing for a tape measure wherein the two parts can be easily connected by click-fitting without the need for extra, separate components and wherein the connection

between the two parts is sufficiently strong that the chance of the two parts becoming separated, e.g. on dropping of the housing, is reduced.

Accordingly, in a first aspect, there is provided a
5 tape measure housing comprising a first part having at least one lipped lug and a second part having at least one retaining means for forming a retaining engagement with a respective lug, each part having an outer wall, the outer walls coming together on the formation of the
10 retaining engagement and wherein at least one of said at least one lug and retaining means is spaced from the outer wall of the first or of the second part respectively.

Preferably, the at least one of said at least one
15 lug and retaining means spaced from the outer wall is positioned in close proximity to the outer wall i.e. adjacent the outer wall such that the internal volume of the housing is substantially unimpeded by the lug and/or retaining means.

20 By forming the at least one lug and/or at least one retaining means spaced from the outer wall of the parts, rather than depending directly from the wall parts as is known, in the event that the outer walls flex, e.g. when the housing is dropped, the engagement between the at

least one lug and retaining means is less likely to be compromised.

By "spaced from", the applicant means that the lug and retaining element adjacent the walls are off-set from
5 and not co-planar with the outer wall i.e. they do not depend directly from the wall part.

Preferably, both the at least one lug and the at least one retaining means are spaced from the wall.

Preferably, there are a plurality of lugs and a
10 corresponding plurality of retaining means.

Preferably, the outer wall of one of the parts has wall portions that comprise a locating channel. The locating channel preferably extends into the wall portion for a minor proportion of the depth of the wall, so as
15 not to weaken the outer wall. The locating channel usually only extends along some of the length of the outer wall of the first part. If the locating channel is in the outer wall of the first part and the lugs depend from the outer wall of the first part, then the locating
20 channel may extend in the outer wall portion past the lugs, and/or may be broken by support members arranged in the channel.

In especially preferred embodiments, the other of the parts has guide means upstanding from an inner edge
25 of the outer wall, the guide means being locatable in the

locating channel in the outer wall of the said one of the parts. If the locating channel is not continuous in the outer wall of the said one of the parts, then the guide means will also be non-continuous.

5 Preferably the or each retaining means has a recess, window or overhang for engaging the lip of the respective lug. In preferred embodiments, the or each retaining element is formed adjacent the outer wall of the second part defining a gap between the outer wall and the or
10 each retaining means in which the respective lug is locatable. Once the lug is located between said outer wall and the respective retaining means, it is held in a gripping engagement. In especially preferred
15 embodiments, the or each retaining means is an upstanding element framing a window that can form an engagement with an inwardly-facing lip of the respective lug.

The housing will have an opening to allow extension and retraction of the tape measure. In preferred
embodiments, there is a lug and retaining means connected
20 to the base portion of the first and second part respectively and positioned adjacent the opening, i.e. remote from the outer wall. In especially preferred
embodiments the retaining means positioned adjacent the opening is an upstanding element depending from the base
25 portion of the second part, the element framing a window

into which the lip of the outwardly-facing corresponding
lug is locatable. Preferably, the retaining means
adjacent the opening also includes a tab located adjacent
the upstanding element thus defining a gap between the
5 element and the tab in which the corresponding lug is
locatable. Once the lug is located between said element
and tab, it is held in a gripping engagement.

Preferably, the housing is formed of rigid plastics
material and most preferably from ABS. The two parts may
10 be formed by injection moulding plastics material.

To connect the two parts, the first and second part
are arranged such that the or each lug is aligned with
the or each respective retaining means. The two parts
are then forced towards each other. The or each lug
15 and/or retaining means is/are slightly, resiliently
deformed by mutual contact until the lip of the lug
locates in the retaining means. On location of the lip,
an engagement is formed between the or each lug and
retaining means such that the outer walls of the two are
20 in close contact.

In a second aspect, there is provided a tape measure
including a housing as described hereinbefore.

A preferred, non-limiting embodiment of the present
invention will now be described with reference to
25 accompanying figures in which:

Figure 1 shows a perspective view of the first part of the housing according to a preferred embodiment of the present invention; and

Figure 2 shows a perspective view of the second part of the housing for connection to the first part shown in Figure 1.

Figure 1 shows the first part, 1, of a tape measure housing, which comprises a base portion, 2, and an outer wall, 3. The first part, 1, of the housing has two upstanding lugs, 4 & 4', each having an inwardly-facing lip, 5 & 5'. The lugs depend from the outer wall, 3, which has a locating channel 6. In the region of lugs 4 and 4', the locating channel, 6, is interrupted by webbings 16.

The first part, 1, also has a further lug, 7, upstanding from the base portion, 2, and located adjacent an opening, 8, in the wall part. This further lug also has a lip, 9, directed away from the opening, 8, on the wall part, 3.

This first part has a spindle, 10, which is integral with the part and onto which a return spring for a flexible tape measure can be wound, and a flexible measure subsequently mounted. In some embodiments, the spindle, 10, may be located on the second part of the

housing and/or may be a separate component from both parts of the housing.

Figure 2 shows the second part, 11, of the housing which is connectable to the first part as shown in Figure
5 1.

The second part of the housing has a base portion, 12, and a outer wall, 13. The part has two retaining means in the form of upstanding elements, 14 & 14', each framing a window, 15 & 15'. The elements depend from the
10 base portion, 12, but are connected to the outer wall, 13, by bridges, 17, such that there is a gap, 26, defined between each element and the outer wall.

The second part includes a further upstanding element, 18, depending from the base portion adjacent an
15 opening, 20, in the outer wall and framing a window, 19. The opening, 20, co-operates with the opening, 8, of the first part to ultimately form an opening in the housing through which the tape measure can be extended and retracted. Adjacent the element, 18, is a tab, 21,
20 defining a gap, 22, between the element, 18, and the tab, 21.

The second part also has guides, 23, upstanding from an inner edge of the outer wall.

A receiving bore, 25, for receiving an end of the spindle, 10, is defined on the base portion, 12, by an annular ring.

To connect the first part as illustrated in Figure 1
5 to the second part as illustrated in Figure 2, the two
part are first arranged such that the lugs, 4 & 4', are
aligned with the upstanding elements, 14 & 14'. The two
parts are then gently forced together. This force causes
the lugs, 4 & 4', to move into the gaps, 26 & 26' defined
10 between the elements, 14 & 14'. Initially, the lugs and
or the upstanding elements are slightly deformed by their
mutual contact. The lips then fit in a click-fit manner
into the windows, 15 & 15', allowing the lugs/upstanding
elements to return to their quiescent state. The
15 elements are arranged such that the lugs fit tightly into
the gaps.

On movement of the two parts towards each other, the
further lug, 7, moves into the gap, 22, defined between
the further element, 18, and the tab, 21. Again the lug
20 and/or element is/are slightly deformed as the lip, 9,
contacts the element, 18, but as the lip, 9, fits into
the window, 19, they return to their quiescent state and
the lug fits tightly in the gap, 22.

Furthermore, movement of the parts causes the guides, 23, on the second part to locate in the channel, 6, of the first part.

The spindle, 10, connected to the base portion of the first part locates in the receiving bore, 25, of the second part.

In use, this housing encloses a flexible tape measure (not shown) which is extendable and retractable. To construct such a conventional tape measure, an end of a return spring is connected to the spindle on the first part and then a spool carrying the would tape is seated on the spindle. Before the second part is then click-fitted to the first part, a brake and bump stop (not shown) are fitted to the first part in the appropriate locations. Subsequently, the second part is click-fitted to the first part as described above to enclose the wound tape measure. On connection of the parts, the openings in the outer walls, 8 & 20, combine to form an opening in the housing through which the tape is extendable and retractable.

The embodiment described above is non-limiting and various modifications will be readily apparent to those skilled in the art.

Claims

1. A tape measure housing comprising a first part having at least one lipped lug and a second part having
5 at least one retaining means for forming a retaining engagement with a respective lug, each part having an outer wall, the outer walls coming together on the formation of the retaining engagement and wherein at least one of said at least one lug and retaining means is
10 spaced from the outer wall of the first or of the second part respectively.

2. A housing according to claim 1 wherein the at least one of said at least one lug and retaining means
15 spaced from the outer wall is positioned in close proximity to the outer wall such that the internal volume of the housing is substantially unimpeded.

3. A housing according to claim 1 or 2 wherein
20 said at least one retaining means includes an upstanding element spaced from the outer wall and thus defining a gap between said outer wall and said element.

4. A housing according to claim 3 wherein said element includes a window, recess or overhang for engaging the lip of the lug.

5 5. A housing according to claim 3 or 4 wherein said lip is inwardly-facing and said lug is locatable in said gap between said outer wall and said element.

6. A housing according to any one of the preceding
10 claims wherein the outer wall of one of said first and second parts has a locating channel.

7. A housing according to claim 6 wherein the locating channel in the outer wall of said first part and
15 is interrupted by webbings.

8. A housing according to claim 6 wherein said other of said first and second parts includes guide means locatable in said locating channel.

20

9. A housing according to any one of the preceding claims wherein said housing includes an opening to allow extension and/or retraction of a tape measure and wherein said first part and said second part have a lipped lug

and a retaining means respectively located adjacent said opening, spaced from said outer wall.

10. A housing according to any one of the preceding
5 claims wherein said housing is formed of rigid plastics material.

11. A housing according to claim 10 wherein said housing is formed by injection moulding.

10

12. A housing substantially as any one embodiment herein described with reference to the accompanying figures.

15 13. A measuring apparatus comprising a flexible tape measure and a housing according to any one of the preceding claims.



INVESTOR IN PEOPLE

Application No: GB 0027787.1

Claims searched: 1-13

14

Examiner: Mike Leaning

Date of search: 12 March 2002

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): B8M (MB7); G1M (MCCE)

Int Cl (Ed.7): B65H (75/14); G01B (3/10); G11B (23/027)

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

| Category | Identity of document and relevant passage | Relevant to claims |
|----------|---|--------------------|
| A | EP 0074007 A2 (HOWARD WALL LTD.) Note the peripheral lipped-lug shown in figure 2 joining the two halves of the housing together. | |
| X | US 5588220 (COUSINS et al.) Whole document is relevant, but see especially parts 9a and 9b in figures 2-2c, 4 & 11 and also column 4 lines 20-29. | 1-4,10&11 |
| X | US 4067513 (RUTTY et al.) See figure 1 and note column 1 lines 49-52. | 1,2,10&11 |
| X | US 3436032 (QUENOT) See the figures. Note the rim 3 which is 'spaced' from the outer wall by groove 4. See also column 1 lines 42&43. | 1-3, 10&11 |
| A | US 3381916 (EDGLL) See figure 7 and note inter-engaging post 86 and stud 87. | |

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