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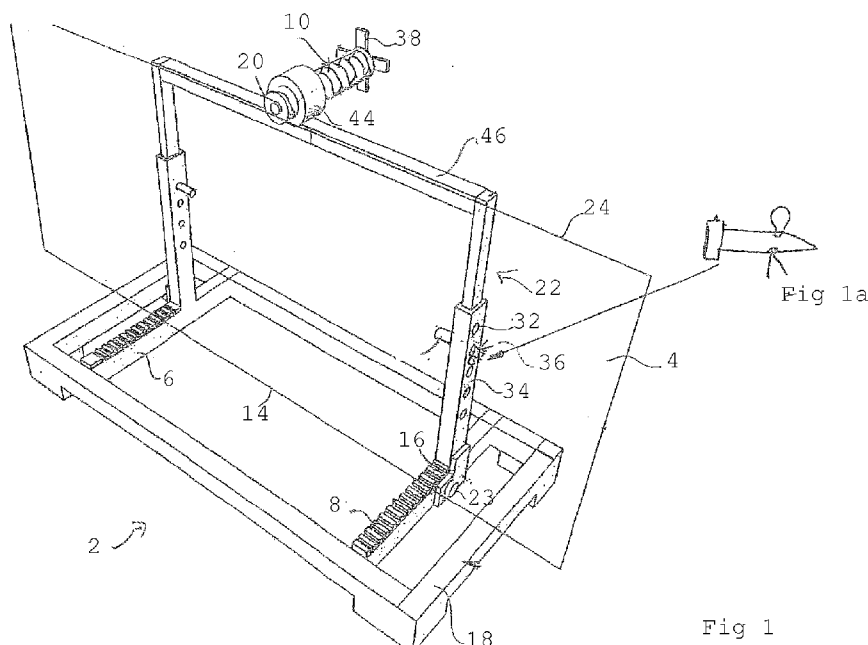
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(54) Title: STILLAGE FOR SHEET MATERIALS



(57) Abstract: The glass holding stillage retains the sheets vertically within the coarse plastic thread (10) at the top or upper edge (24) of the sheet product, and the castellated plastic base rail (8) at the bottom or lower edge (14) of the product. The depth (height) of the sheet can vary due to the vertical support (22) being adjustable. A spring loaded safety interlock device (40) is employed as a safety feature. The whole assembly is retained on a hollow section alloy base frame (18). The stillage is also collapsible for ease of distribution and transportation. This can be utilized for holding other materials which are rigid and in sheet form.



## STILLAGE FOR SHEET MATERIALS

This invention relates to a stillage for sheet materials. There is a requirement to store  
5 glass and other sheet type materials, in a safe and manageable form. This can be within  
a workshop or on site prior to the fitting or utilisation of such products.

For example, It has been the practice for many years to either carry or hoist glass and  
other sheet type materials to the desired floor level on site and then to store this glass or  
10 other product in bulk prior to fitting. This practice for example, has resulted in persons  
trying to retain glass sheets in the vertical orientation so that it is easy to handle the  
sheets by manual or mechanical means.

One problem with this approach is that the glass or other products may have been leant  
15 against a column or other structure prior to use. The glass sheet either during its removal  
from bulk or even in a singular state, can slip or topple, when in a static vertical but  
unsafe or unsecured condition. Glass has on occasion slipped or fallen and caused  
severe injury to personnel.

20 Several health and safety conscious companies have now insisted that each individual  
sheet of glass has to be band wrapped to a glass stillage, which usually takes the form of  
a timber or steel A frame, prior to and during their use and storage. For example, if a  
sheet of glass is required for use and is un banded, should the sheet not be fitted  
immediately, it has to be taken back to the stillage and re banded. This is very time  
25 consuming, costly and can damage the glass on its face or edges. An additional issue is  
waste removal, and the banding being a trip hazard should it not be disposed of  
correctly.

According to the present invention, there is provided a stillage adapted for the storage of  
30 at least one sheet of material in the substantially vertical configuration, the stillage  
comprising a frame, having at least one castellated base rail adapted to engage a lower  
edge of at least one sheet, and a threaded member rotatably mounted on the frame and  
arranged to be adjacent the upper edge of the sheet and adapted to engage said upper

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sheet edge within the threads, thereby holding the sheet vertically.

The threaded member may be rotated to draw the upper edge of the sheet in, and a further sheet may be introduced, with the castellated base rail securing the lower edge of 5 each sheet.

In order that the invention may be more readily understood, reference will now be made to the accompanying drawings, in which:

Figure 1 is a front perspective view of a stillage assembly according to one 10 embodiment of the invention;

Figure 1a is an expanded view of part of Figure 1;

Figure 2 is a rear perspective view of the stillage of Figure 1;

Figure 3 is an expanded view of part of the stillage as shown in Figure 2;

Figure 4 is a side view of the threaded member and nut of the stillage of Figure 1;

15 Figure 5 is a front perspective view of the threaded member of Figure 4;

Figure 6a and 6b are further front perspective views, Figure 6c is a cross-section side view, and 6d and 6e are plan and side views respectively of the threaded member of Figure 4;

Figure 7 is an expanded side view of the threaded member and nut;

20 Figures 8a and 8b are an expanded cross-section plan view Y-Y and an expanded side view respectively of the threaded member and nut of Figure 4.

Referring to Figures 1 to 3, a stillage (2) retains the glass or other sheet products (4) between a pair of base rails (6) for example formed of plastic material, and having 25 castellations (8), and within the depth of a helical thread (10). This is accomplished by placing the panel of glass centrally (side to side) within the base plastic rails (6) (see Figs 1, 2 & 3), so that the castellations (8) retain the base of the glass in a secure manner within their depth. The helical threaded member (12) is retracted to the point above the inner-most castellation (16) allowing the glass to be about 90 degrees to the base frame 30 (18) and thus resting on the face (20) of the plastic thread.

The upper or second frame (22) is raised or lowered telescopically to suit the glass or product sheet size, so that the top edge (24) of the product to be retained, will fall within

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the depth of the helical thread (12) but below the central core (26) of the threaded member (12) making sure the set position allows for example at least 10mm glass edge cover (28) (see Figs 5 & 6 and position (P1), and Fig. 7). After the adjustable frame (22) has been raised or lowered to suit the product, a securing pin (30) is located through a  
5 selected one of a plurality of spaced apertures (32) in the pair of outer telescopic members (34) so as to lock the frame (22) in position. A safety clip (36) is then used to fix the pin (30) into position.

After adjusting the frame (22) into the desired position and placing the glass into the  
10 lower castellations (8), the threaded member (12) is rotated by a handle (38) to put the thread (10) into the correct position, as claimed in Fig 5, and position P1 shown in Figs 6 & 7. In doing so the helical thread (10) laps the glass at its upper edge (24) for one thread pitch. The safety plunger (40) (see Figs 4,5,6,7 and 8), will drop into the thread slots (42) (Figs 4 & 5) and prevent further rotation of threaded member (12). The slots  
15 (42) are aligned along the length of the threaded member (12), such that the plunger (40) riding over the thread (10) will drop into a slot (42) once per revolution. The next sheet is placed onto the open face (20) of threaded member (12) as shown in Fig 4 position P2. The safety plunger (40) is arranged to be manually lifted so as to overcome the force of the spring (41) within, (see Figs. 4,5 & 8) and the threaded member (12) is again rotated  
20 through a fixed nut (44), which is fixedly mounted on a cross-member (46) of the upper frame (22), for one revolution, so as to encapsulate the edge (24) of the glass again (see Fig. 4). The process is repeated until the desired number of sheets (4) are retained within the helical threaded member (12) and the lower castellated base (6).

25 To remove the glass (4) for use, the process is reversed. The glass (4) is held by hand or by the use of a glass suction device affixed to the front face of the glass sheet by operative number 1, whilst the second operative lifts the safety plunger (40) (see Figs 5 & 8). The operator number 2 rotates the threaded member (12) through the static nut (44) in the opposite direction until the thread (10) releases the top edge of the first piece  
30 of glass, whilst still retaining the other sheets within the helical thread (10) in a safe condition. As the glass comes to the point of release it is then in an unsafe condition and must be held by an operator until both have a good grip of the sheet and are ready to lift free from the castellated base members (6) for use or distribution.

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Due to the fact that once the helical threaded member (12) during either loading or unloading, has rotated one rotation through the fixed nut (44), the safety plunger (40) is forced by its spring (41) down into the thread cut out (42) (see Fig 8) and prevents any further rotation of the member (12) until plunger (45) is manually lifted against the force of the spring (41).

The primary components, threaded member (12), nut (44), castellated plastic base rails (6) and adjustable upper frame (22) are all attached to the main base frame (18), for example formed of hollow section alloy.

The storage or transport of the stillage, the upper frame (22) may be folded about a pair of pivots (23) mounting the upper frame (22) onto the lower frame (18) via a bracket (25) (see Fig 3) so as to lie flat against each other.

15

The stillage (2) can be made to accommodate varying product sizes by increasing the dimensions of the component parts, thread pitch and castellation pitch and width etc.

#### Key

- 20 (44) Large plastic nut
- (38) Four point plastic handle
- (12) Coarse plastic helical threaded shaft (upper product edge support)
- (6) Castellated plastic base rail (product lower edge support)
- (23) Pivot pin
- 25 (22) Height adjustable top alloy frame
- (20) Load positional face of plastic helical thread
- (40) Spring loaded safety plunger pin
- (42) Safety plunger thread cut out
- (4) Sheet product
- 30 (P1) Product load position 1
- (P2) Product load position 2
- (30) Tapered frame locking pin
- (36) Tapered locking pin securing clip

(18) Hollow section fabricated base frame

**CLAIMS**

1. A stillage adapted for the storage of at least one sheet of material in the substantially vertical configuration, the stillage comprising a frame, having at least one castellated base rail adapted to engage a lower edge of at least one sheet, and a threaded member rotatably mounted on the frame and arranged to be adjacent the upper edge of the sheet and adapted to engage said upper edge within the threads, thereby holding the sheet vertically.
2. A stillage as defined in claim 1, wherein the castellated base rail(s) and/or the threaded member are formed from a plastics material.
3. A stillage as defined by claim 1 or 2 adapted for the storage of panes of glass or other sheet materials.
4. A stillage as defined in any preceding claim wherein the height of the threaded member is adjustable to accommodate a range of sheet sizes.
5. A stillage as claimed in any one of claims 1 to 4, comprising a spaced pair of base rails.
6. A stillage as defined by any preceding claim further comprising a first frame carrying the base rails and a second frame pivotally connected to the first frame and carrying the threaded member, wherein the said pivotal connection is adapted to allow the frames to be folded flat.
7. A stillage as defined in any preceding claim, wherein the threaded member further comprises a safety device adapted to lock the threaded member in place and thereby prevent accidental rotation of the same.
8. A stillage as claimed in claim 7, in which the safety device comprises a plunger, mounted on the frame and biased towards the threaded member, and a plurality of spaced corresponding recesses provided in the threaded member to engage

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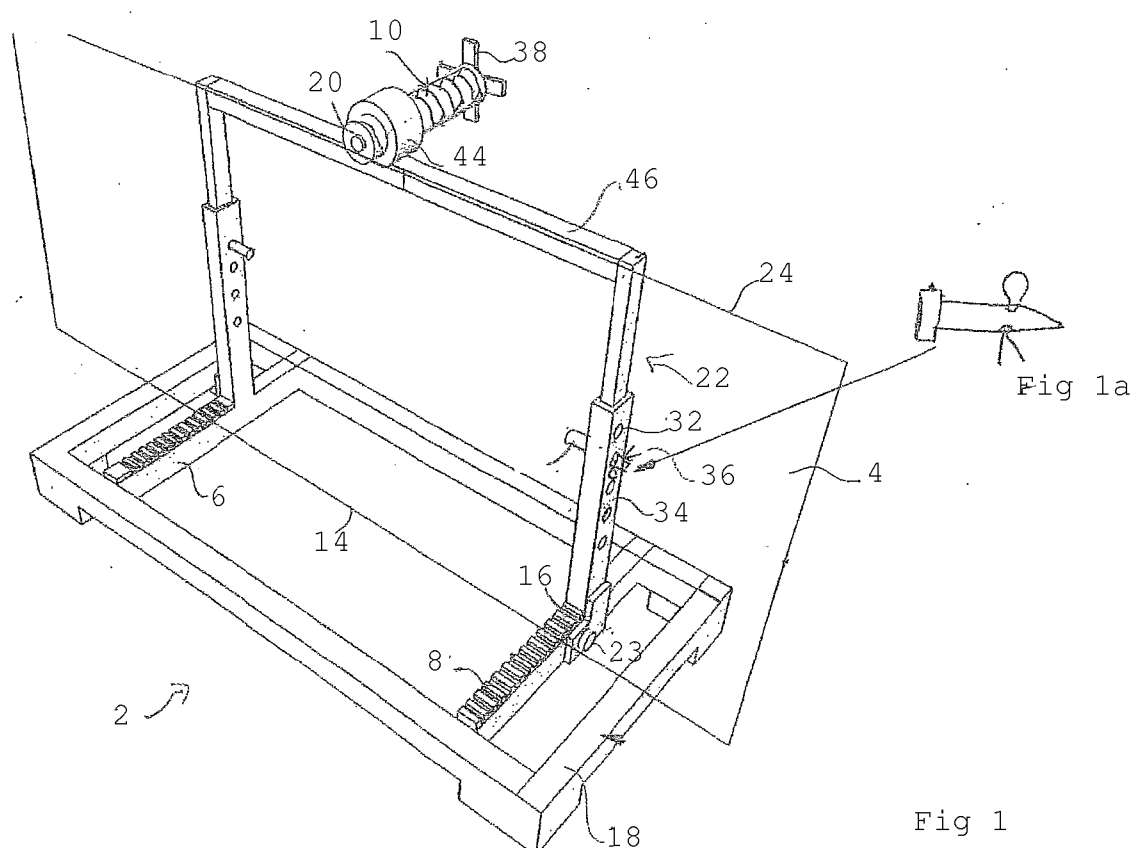
with the plunger and prevent rotation.

9. A stillage, as claimed in claim 8, in which the plunger is arranged to be manually movable against the bias away from the threaded member to release the threaded member for rotation.

10. A stillage as claimed in claim 8 or 9, in which the plunger is mounted to a nut for the threaded member, the nut being fixedly mounted to the frame.

11. A method of storing a plurality of glass or other sheet material comprising; (a) providing a stillage according to any proceeding claim; (b) locating the lower edge of a sheet to be stored in the castellated base rail(s); (c) rotating the threaded member to bring it into engagement with the top edge of the sheet and; (d) repeating steps b-c with subsequent sheets.

12. A method of releasing a glass or other sheet materials for use comprising; with a stillage as defined by any of claims 1-10, rotating the threaded member to release the upper edge of a glass sheet or other sheet material and lifting the sheet clear of the stillage.



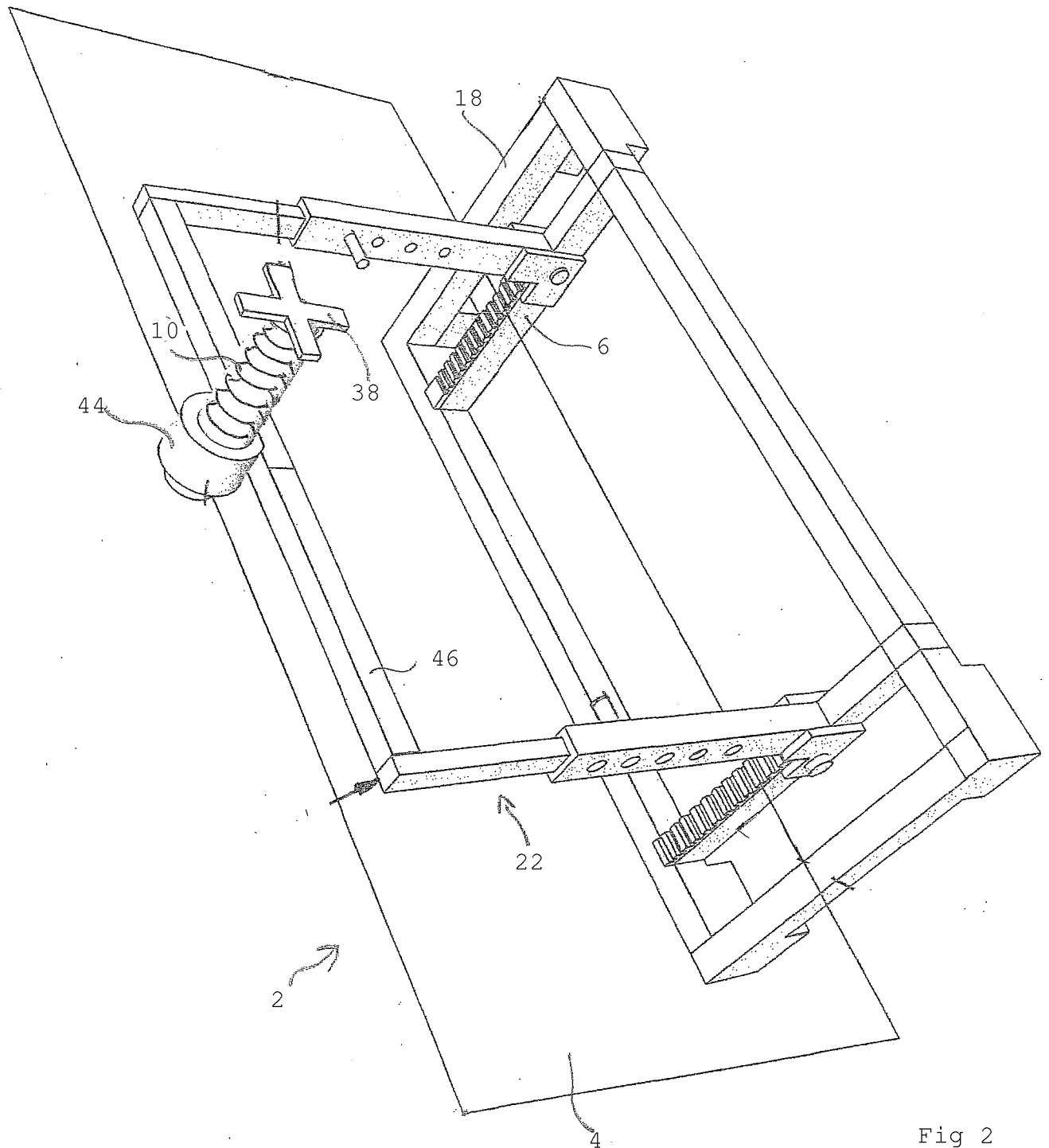
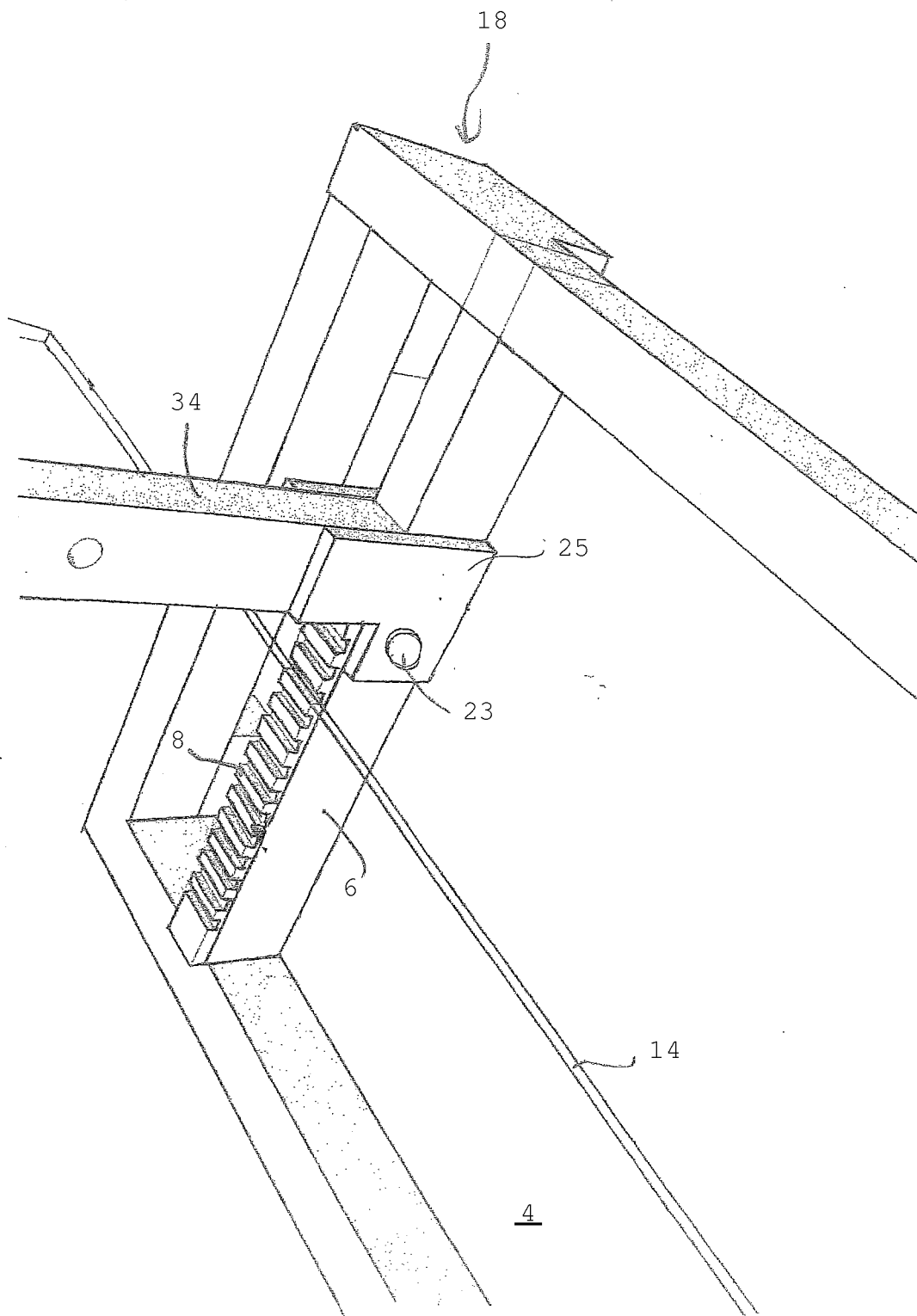


Fig 2



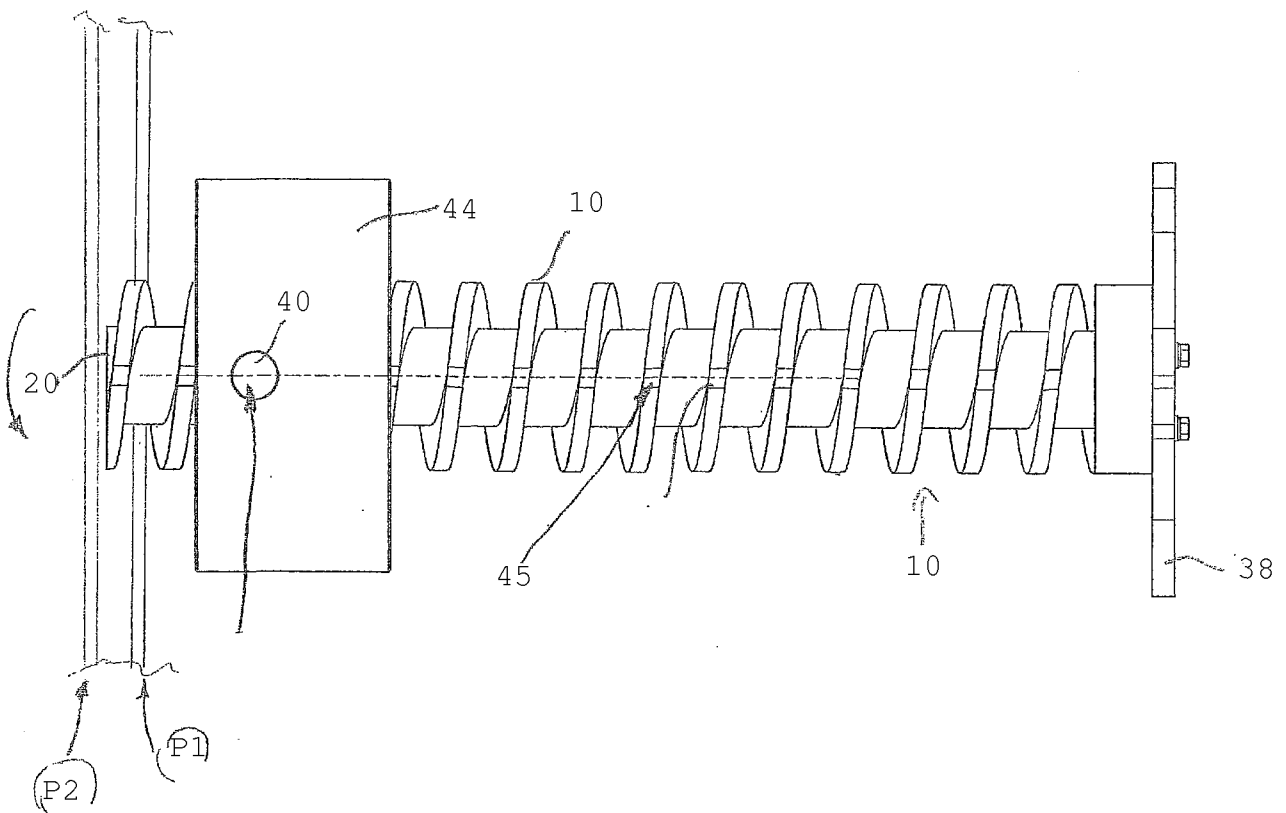


Fig 4

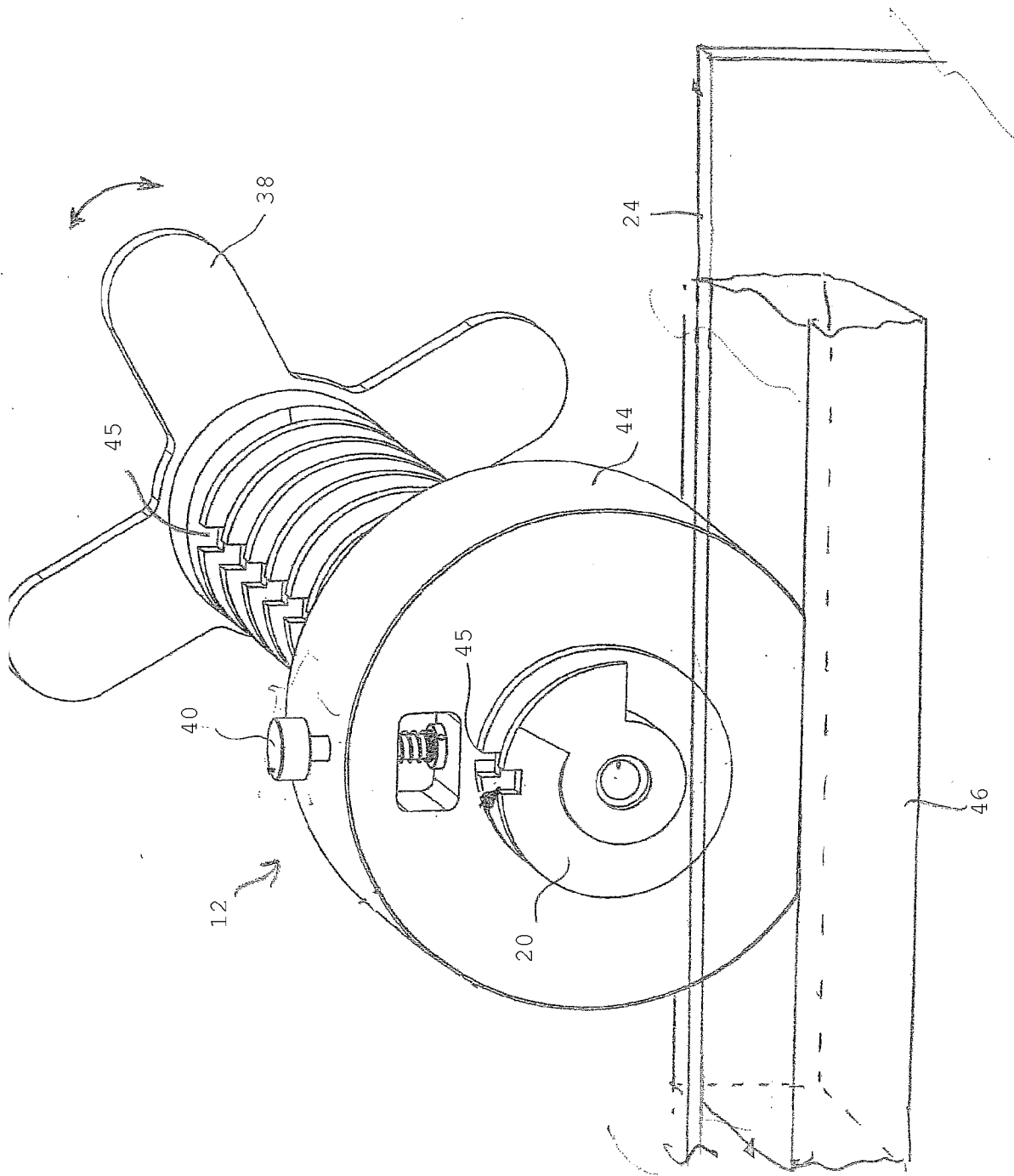
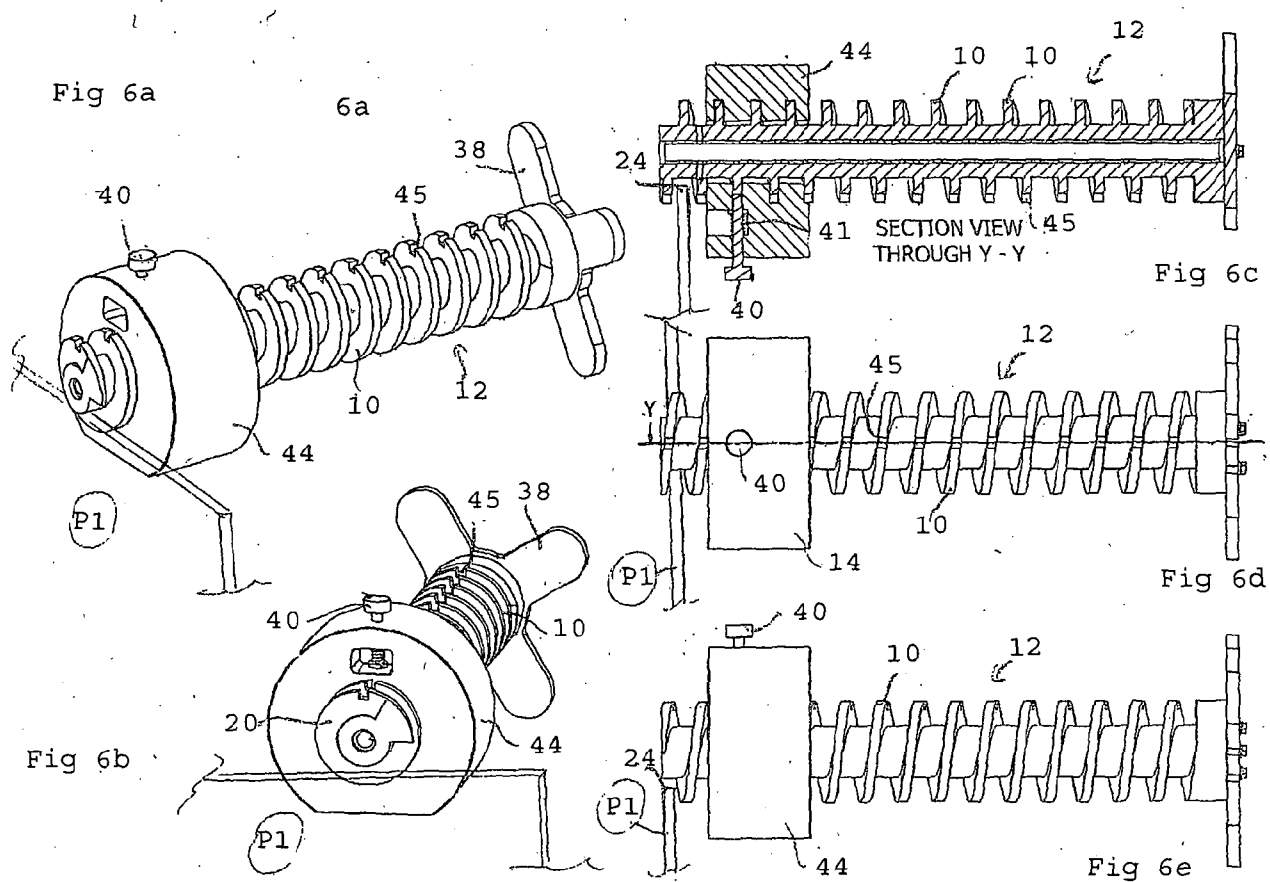


Fig 5



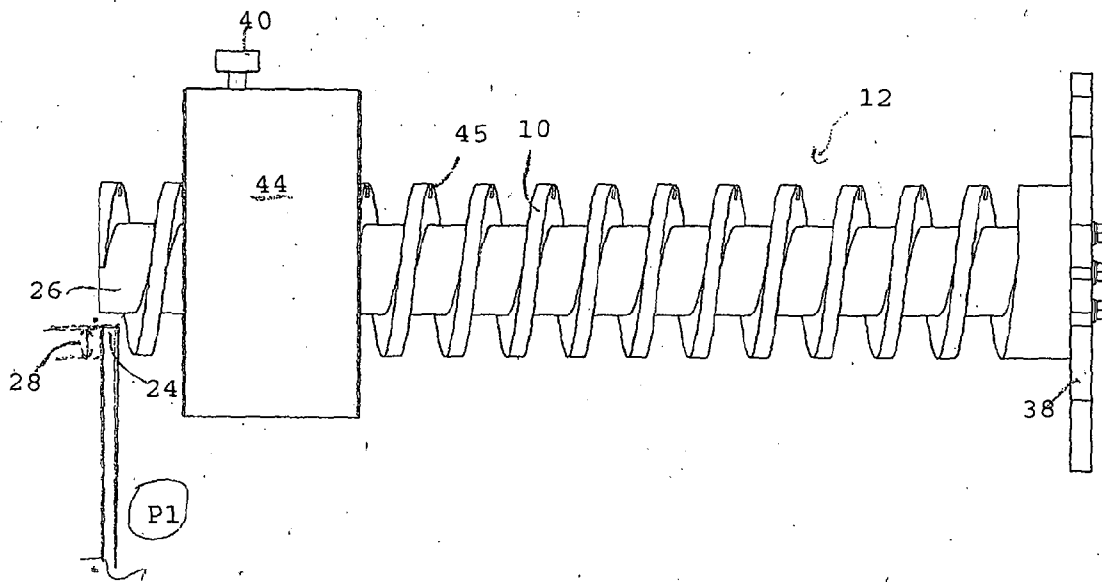
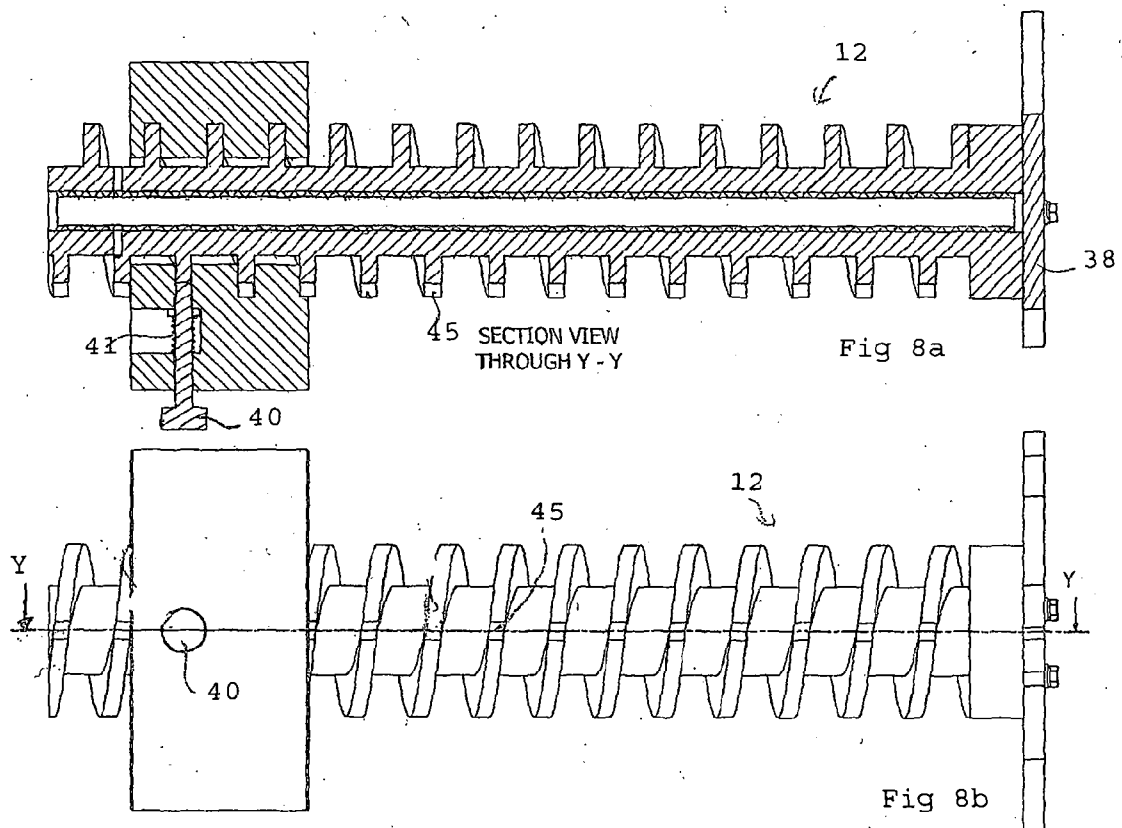


Fig 7



## INTERNATIONAL SEARCH REPORT

International application No  
PCT/GB2013/050675

| <b>A. CLASSIFICATION OF SUBJECT MATTER</b><br>INV. B65G49/06 B62B1/26 B65D19/44 B65D85/48 E04F21/18<br>ADD.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |   |                                                                                                   |      |   |                                                                                  |      |   |                                                                                             |      |   |                                                                                                                  |      |  |     |  |
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| <b>B. FIELDS SEARCHED</b><br>Minimum documentation searched (classification system followed by classification symbols)<br>B65G B62B B65D E04F                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |   |                                                                                                   |      |   |                                                                                  |      |   |                                                                                             |      |   |                                                                                                                  |      |  |     |  |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |   |                                                                                                   |      |   |                                                                                  |      |   |                                                                                             |      |   |                                                                                                                  |      |  |     |  |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)<br>EPO-Internal, WPI Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |   |                                                                                                   |      |   |                                                                                  |      |   |                                                                                             |      |   |                                                                                                                  |      |  |     |  |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b> <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>EP 1 142 756 A2 (CUENCA CANDEL ANTONIO [ES]) 10 October 2001 (2001-10-10)<br/>figures 1-2<br/>-----</td> <td>1-12</td> </tr> <tr> <td>A</td> <td>US 2 828 869 A (CORLEY GALE C)<br/>1 April 1958 (1958-04-01)<br/>figure 1<br/>-----</td> <td>1-12</td> </tr> <tr> <td>A</td> <td>US 5 641 076 A (ENGLUND CARL E [US])<br/>24 June 1997 (1997-06-24)<br/>figures 12,13<br/>-----</td> <td>1-12</td> </tr> <tr> <td>A</td> <td>GB 989 763 A (BRITISH PETROLEUM CO;<br/>MAURICE JOHN DELVE)<br/>22 April 1965 (1965-04-22)<br/>figures 1-3<br/>-----</td> <td>1-12</td> </tr> <tr> <td></td> <td>-/-</td> <td></td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    | Category*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Citation of document, with indication, where appropriate, of the relevant passages                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Relevant to claim No. | A | EP 1 142 756 A2 (CUENCA CANDEL ANTONIO [ES]) 10 October 2001 (2001-10-10)<br>figures 1-2<br>----- | 1-12 | A | US 2 828 869 A (CORLEY GALE C)<br>1 April 1958 (1958-04-01)<br>figure 1<br>----- | 1-12 | A | US 5 641 076 A (ENGLUND CARL E [US])<br>24 June 1997 (1997-06-24)<br>figures 12,13<br>----- | 1-12 | A | GB 989 763 A (BRITISH PETROLEUM CO;<br>MAURICE JOHN DELVE)<br>22 April 1965 (1965-04-22)<br>figures 1-3<br>----- | 1-12 |  | -/- |  |
| Category*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Citation of document, with indication, where appropriate, of the relevant passages                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Relevant to claim No.                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |   |                                                                                                   |      |   |                                                                                  |      |   |                                                                                             |      |   |                                                                                                                  |      |  |     |  |
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| <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |   |                                                                                                   |      |   |                                                                                  |      |   |                                                                                             |      |   |                                                                                                                  |      |  |     |  |
| * Special categories of cited documents :<br><table border="0"> <tr> <td>           "A" document defining the general state of the art which is not considered to be of particular relevance<br/>           "E" earlier application or patent but published on or after the international filing date<br/>           "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)<br/>           "O" document referring to an oral disclosure, use, exhibition or other means<br/>           "P" document published prior to the international filing date but later than the priority date claimed         </td> <td>           "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention<br/>           "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone<br/>           "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art<br/>           "&amp;" document member of the same patent family         </td> </tr> </table> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    | "A" document defining the general state of the art which is not considered to be of particular relevance<br>"E" earlier application or patent but published on or after the international filing date<br>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)<br>"O" document referring to an oral disclosure, use, exhibition or other means<br>"P" document published prior to the international filing date but later than the priority date claimed | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention<br>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone<br>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art<br>"&" document member of the same patent family |                       |   |                                                                                                   |      |   |                                                                                  |      |   |                                                                                             |      |   |                                                                                                                  |      |  |     |  |
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| 9 January 2014                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 16/01/2014                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |   |                                                                                                   |      |   |                                                                                  |      |   |                                                                                             |      |   |                                                                                                                  |      |  |     |  |
| Name and mailing address of the ISA/<br>European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040,<br>Fax: (+31-70) 340-3016                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Authorized officer<br><br>Marrec, Patrick          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                       |   |                                                                                                   |      |   |                                                                                  |      |   |                                                                                             |      |   |                                                                                                                  |      |  |     |  |

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International application No

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