

(12) **UK Patent Application** (19) **GB** (11) **2 276 615** (13) **A**

(43) Date of A Publication **05.10.1994**

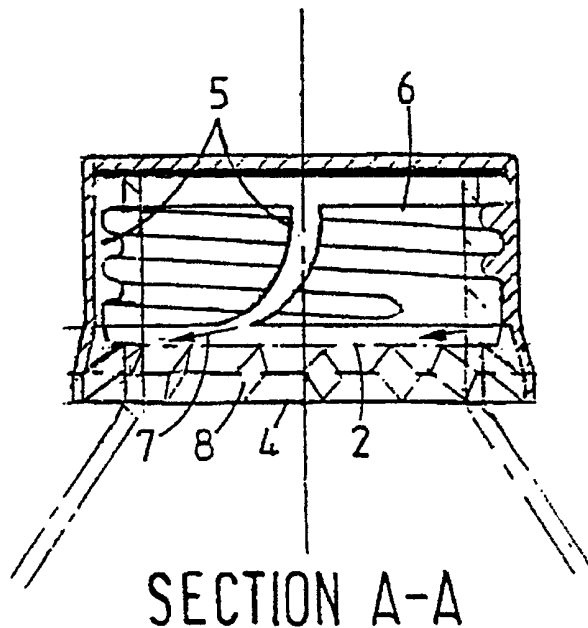
(21) Application No **9323891.3**
(22) Date of Filing **19.11.1993**
(30) Priority Data
(31) **9305336** (32) **16.03.1993** (33) **GB**

(71) Applicant(s)
Harold Birkett
10 Brooklands Road, Crumpsall, MANCHESTER,
M8 4JJ, United Kingdom
(72) Inventor(s)
Harold Birkett
(74) Agent and/or Address for Service
Harold Birkett
10 Brooklands Road, Crumpsall, MANCHESTER,
M8 4JJ, United Kingdom

(51) INT CL⁵
B65D 51/16
(52) UK CL (Edition M)
B8T TWH T13A T14B T14E
U1S S1106
(56) Documents Cited
EP 0009854 A
(58) Field of Search
UK CL (Edition M) **B8T THT TWH**
INT CL⁵ **B65D 51/16**
ONLINE DATABASES: WPI

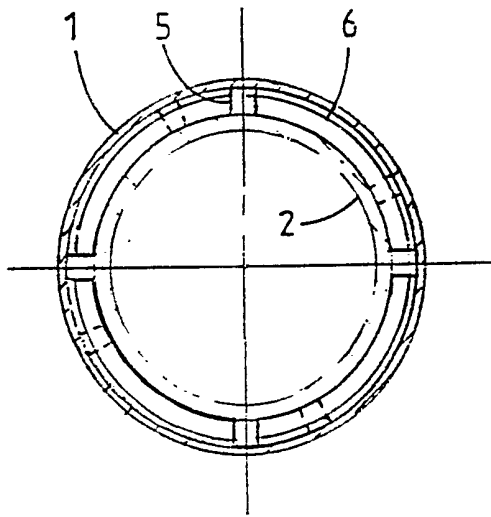
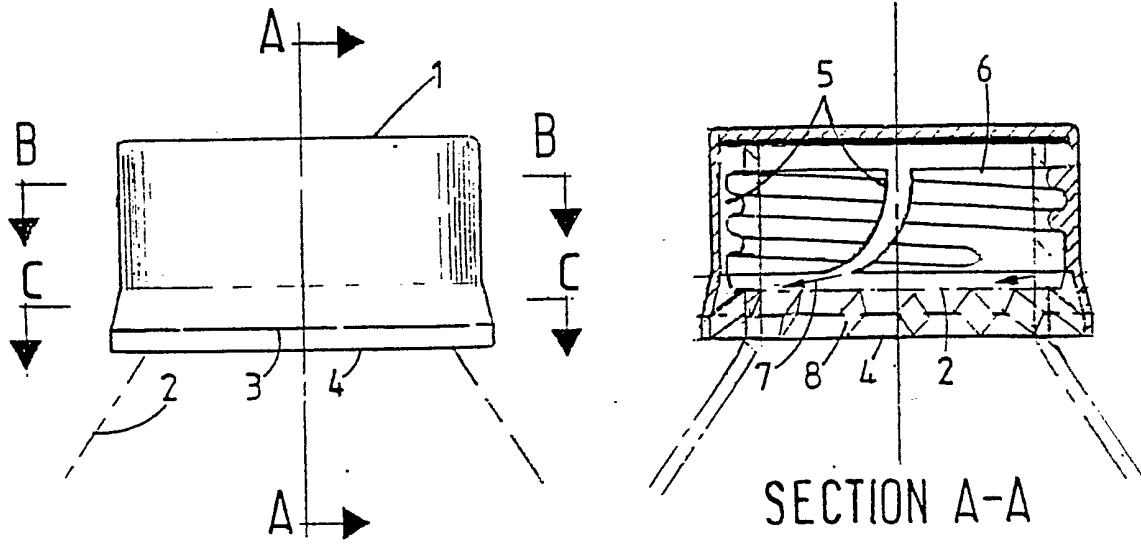
(54) **Screw threaded cap with venting passage**

(57) A screw threaded cap for a container has at least one passage 5 to allow release of pressure from the container when the cap is only partially unscrewed, the passage being shaped such that a first reactive component force of the escaping gas acts on the cap in a clockwise direction resulting in a tendency for the cap to be screwed back on the cap. Preferably a projection (9, Figure 5) on the upper surface of the thread of the cap and a recess (10, Figure 5) on the under surface of the thread on the container are pressed into mating engagement by a second reactive component force of the escaping gas imposing an upward pressure on the cap. Four passages 5 may be provided and they may be curved with their lower ends directed against vanes 8 forming part of a lower taper evident section of the cap, a shear line lying between the section and the remainder of the cap being broken on initial unscrewing of the cap. The passages 5 may be moulded into the thread profile and form part of the outer profile of the cap body (Figures 2 - 4), the outer profile providing efficient gripping portions and/or providing a profile similar to a crown cap.

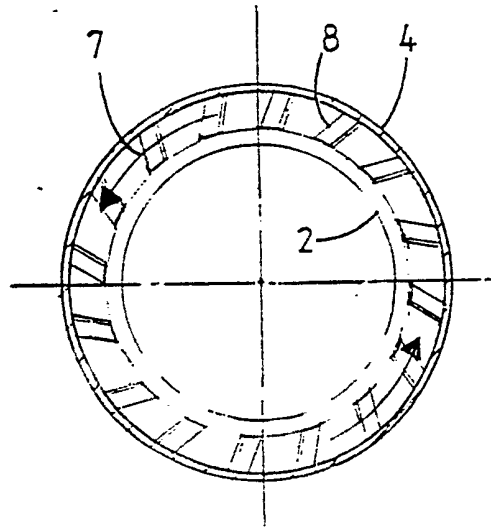


GB 2 276 615 A

1/4



SECTION B-B



SECTION C-C

FIG 1

2/4

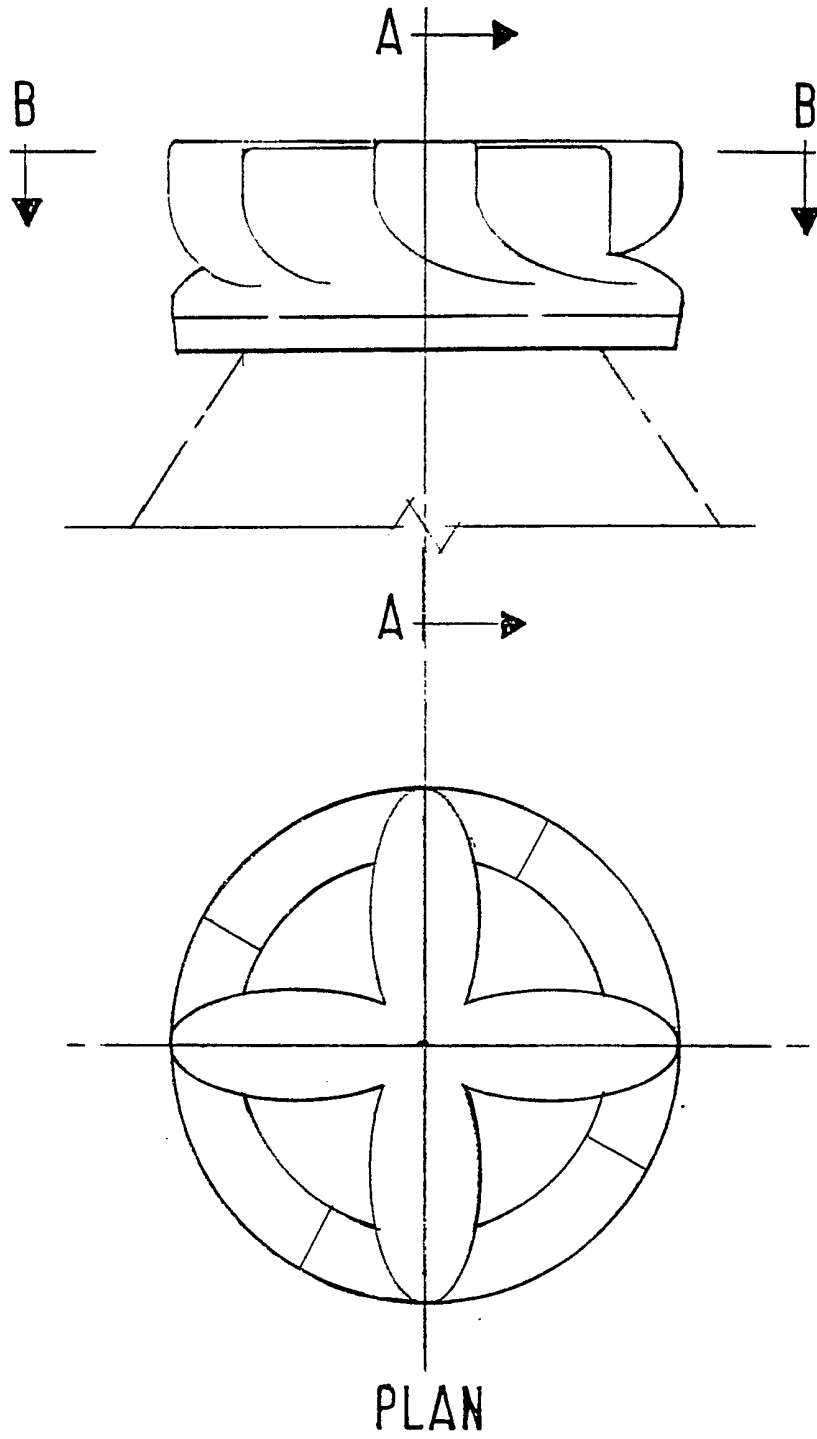
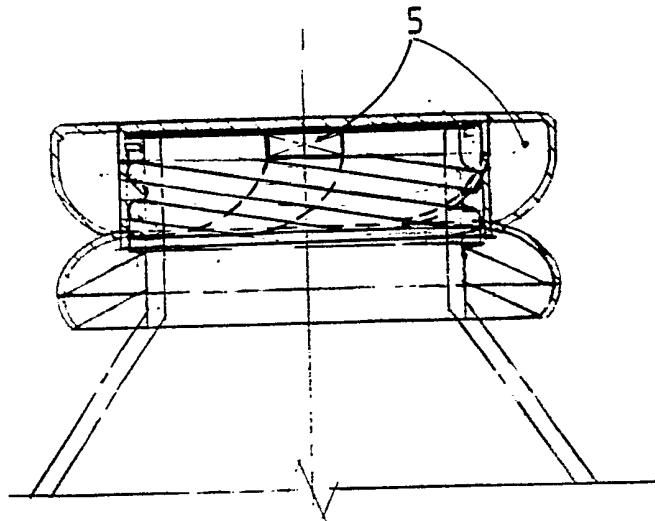
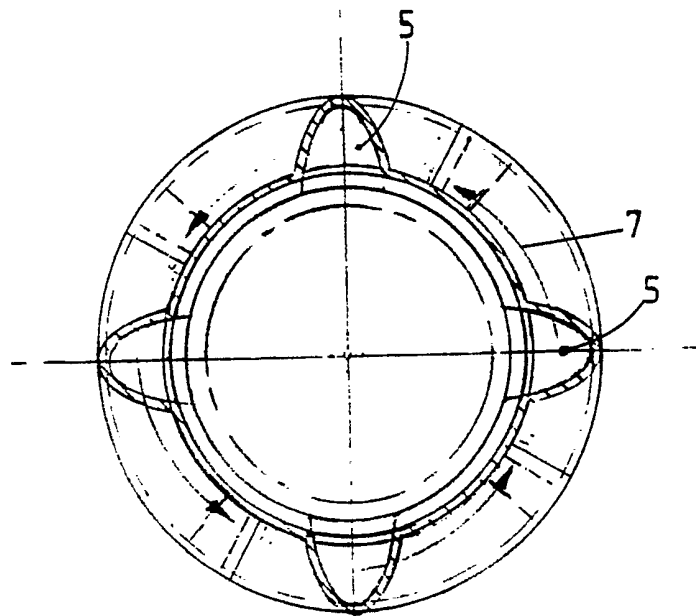


FIG 2

3/4



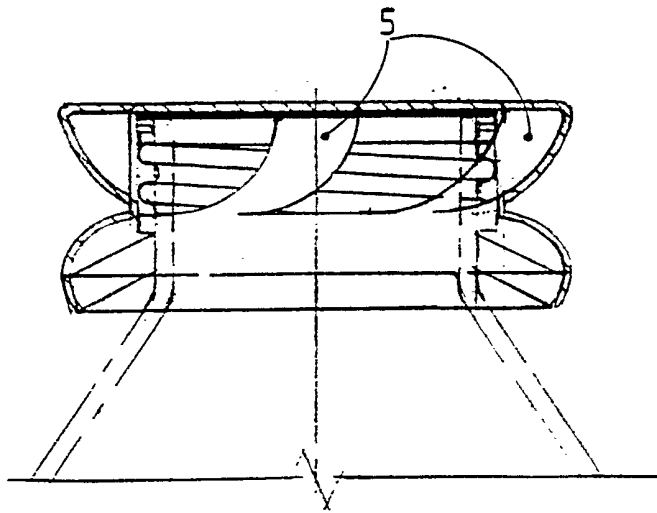
SECTION A-A



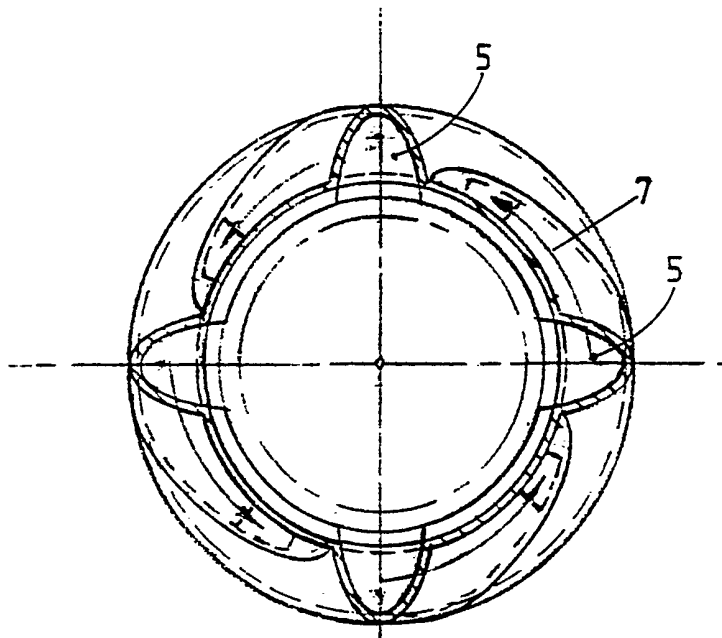
SECTION B-B

FIG 3

4/4



SECTION A-A



SECTION B-B

FIG 4

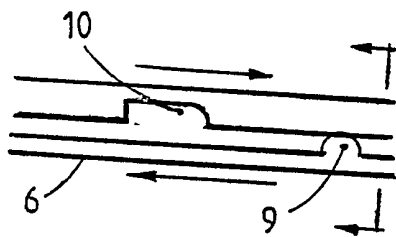
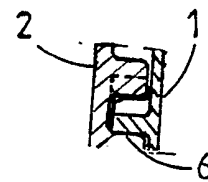


FIG 5



SECTION

-1-

IMPROVED SCREWED CAP FOR PRESSURISED CONTAINER.

This invention relates to screwed caps used on any type of container with screwed connection which is subject to pressure such as a bottle containing mineral water which can be taken as an example.

Existing caps can have pressure relief slots inside extending from the top to the bottom of the cap parallel to the axis of the bottle so that when the bottle is opened the gasses escape from inside the bottle down the slots and out to atmosphere thus relieving pressure prior to the cap being fully unscrewed and released from the bottle.

According to the present invention the screwed cap provided is such that when it is partly unscrewed the gas released under pressure from the bottle escapes through at least one passageway formed inside the cap in such a manner that some of the reactive component forces of the escaping gasses acting upon the screwed cap are in a clockwise direction resulting in a tendency for the cap to be screwed back on again whilst some of the reactive component forces will impose an upwards pressure onto the cap and thread inside which if required can be profiled or serrated or notched along the top side for a length to suit so that it is pressed against and engages the mating profiled thread or serrated or notched profile suitably located on the underside of the thread on the bottle thus preventing or resisting the removal of the cap whilst the pressure is too high the pressure imposed onto the cap being in proportion to the pressure imposed from inside the bottle upon the top area of the cap and also the reactive force of the escaping gasses so that the higher the pressure inside the bottle the greater the resistance or prevention to the removal of the cap.

Fig 1, shows an example of a mineral water bottle using the above invention where the captive cap 1, which is screwed onto bottle 2, is provided with four pressure relief passageways 5, through which the gasses escape during the process of unscrewing the cap after shear line 3, has been broken when the escaping gasses 7, are directed as shown against vanes 8, which form part of captive section 4, of cap 1, escaping gasses being diverted downward to atmosphere. A converging / diverging pressure relief passageway will initially create a venturi effect adjacent to opening on shear line 3, resulting in escaping gasses being ejected downwards.

One pressure relief passageway 5, only, would result in the reactive pressure being greater on one side of the cap when the eccentric pressure of the cap thread 6, upon the underside of the thread on the bottle would be taken into consideration and could be used in conjunction with methods described above to resist or prevent the removal of the cap when the pressure is too high

Figs 2, 3 and 4, show pressure relief passageways 5, moulded into and forming part of the outer profile of the cap body 1. It will be seen that the outward projecting profile shape of the walls of the pressure relief passageways will provide a more efficient grip and torque leverage required to unscrew the cap when compared to Fig 1.

The more efficient grip and torque leverage enables the cap to be unscrewed more easily and be more user friendly than existing state of the art caps especially to people who have a weak grip.

The invention described could also enable the cap to have a quick acting release action due to the fact that increased torque loading could be applied to the cap during the bottling process which in turn would allow for a courser or a multi-start thread to be used whilst still achieving the required pressure resistant seal, thus enabling the cap to be unscrewed similar to existing caps but with less angular movement, resulting in a quick opening user friendly cap whose angular opening movement could be half a turn for instance which would provide the advantages of speed (as required in the catering trade for instance) combined with safety.

The pressure relief passageways 5, are shown moulded from top to bottom on the inside into the thread profile in Figs 1 and 4.

Fig 3, shows the pressure relief passageways moulded from the inside at the top and the on the outside of the threads to the bottom.

Fig 5, shows an example of a at least one projecting profile 9, located on the top surface of the thread on the cap 1, and at least one mating notched profile 10, located on the underside of the thread on the bottle 2, whose function is to prevent or resist the rotation of the cap when they mate during the period of time whilst the pressure is excessive as previously described.

Fig 2, shows that the cap has a distinctive profile similar to that of a crown and would therefore lend itself to a title including the word crown such as 'Crown Stopper' for instance although there are other shapes of pressure escape passageways and outside profiles which could be used the ones shown being examples only.

CLAIMS.

1. A screwed cap used on any type of container with a screwed connection which is subject to pressure such that when it is partly unscrewed the gas released under pressure escapes through at least one passageway formed inside the cap in such a manner that some of the reactive component forces of the escaping gasses acting upon the cap are in a clockwise direction resulting in a tendency for the cap to be screwed back on again.
2. A screwed cap as claimed in Claim 1, where the reactive component forces of the escaping gasses will impose an upward pressure onto the cap and thread inside which is profiled or serrated or notched along the top side of the thread to suit so that it is pressed against and engages the mating profiled or serrated or notched located on the underside of the thread on the bottle thus preventing or resisting the removal of the cap whilst the pressure from inside the bottle is too high.
3. A screwed cap as claimed in Claim 1, or 2, where the greater the pressure inside the container the greater the resistance or prevention to the removal of the cap.
4. A screwed cap as claimed in any preceding claims where there is one pressure relief passageway only, which results in the reactive pressure being greater on one side of the cap when the eccentric pressure of the cap thread upon the underside of the thread on the bottle would be taken into consideration and could be used in conjunction with methods described above to resist or prevent the removal of the cap when the pressure is too high
5. A screwed cap as claimed in Claim 1, where the pressure relief passageways are moulded into and form part of the outer profile of the cap body which will provide a more efficient grip and torque leverage for both screwing on and unscrewing the cap.
6. A screwed cap as claimed in Claims 1, or 5, would allow for a quick opening easy to grip user friendly cap whose angular opening movement would be less than existing caps whilst still achieving the same pressure resisting seal.
7. A screwed cap as claimed in any preceding claims which has a distinctive profile similar to that of a crown and would therefore lend itself to a title including the word crown.
8. A screwed cap substantially as described herein with reference to Figures 1 - 5 of the accompanying drawings.

Amendments to the claims have been filed as follows

1. A screw threaded cap for use on a container having a screw threaded neck, the container being capable of containing gasses or liquids under pressure, the cap having a surface or surfaces against which gas released under pressure upon opening of the cap can impinge, the reactive forces acting on the said surface or surfaces, acting upon the cap in a direction tending to screw the cap onto the container.
2. A cap as claimed in claim 1 in which the thread on the cap is profiled or serrated or notched along the top side of the thread enabling the cap thread to be pressed against and engage a mating profiled serrated or notched thread located on the underside of the container thread.
3. A cap as claimed in claim 1 or claim 2 where the reactive component forces of the escaping gasses will impose an upward pressure onto the thread on the cap so that it is pressed against and engages the mating underside of the thread on the bottle thus preventing or resisting the removal of the cap whilst the pressure from inside the bottle is too high.
4. A cap as claimed in any preceding claim where the greater the pressure inside the container the greater the resistance or prevention to the removal of the cap.
5. A cap as claimed in any preceding claims having a single pressure relief passageway, through which the released gas can flow which results in the reactive pressure being greater on one side of the cap when the eccentric pressure of the cap thread upon the underside of the thread on the bottle would be taken into consideration and could be used in conjunction with methods described above to resist or prevent the removal of the cap when the pressure is too high
6. A cap as claimed in claim 1 or claim 2 in which one or more pressure relief passageways are moulded into and form part of the outer profile of the cap.
7. A cap as claimed in claim 6 which will provide a more efficient grip and torque leverage for both screwing on and unscrewing the cap.
8. A cap as claimed in claim 6 or claim 7 which would allow for a quick opening cap whose angular opening movement would be less than existing caps whilst still achieving the same pressure resisting seal.
9. A cap as claimed in any preceding claims which has a distinctive profile similar to that of a crown and would therefore lend itself to a title including the word crown.
10. A screwed cap and container constructed and arranged for use and operation substantially as herein described and with reference to the accompanying drawings.

Relevant Technical Fields

(i) UK Cl (Ed.M) B8T (THT, TWH)

(ii) Int Cl (Ed.5) B65D 51/16

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE DATABASES: WPI

Search Examiner
 LINDA HARDEN

Date of completion of Search
 18 MAY 1994

Documents considered relevant following a search in respect of Claims :-
 1-8

Categories of documents

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

| Category | Identity of document and relevant passages | Relevant to claim(s) |
|----------|-------------------------------------------------------------|----------------------|
| X | EP 0009854 (METAL CLOSURES LTD) see embodiment of Figure 3 | 1 |

Databases:The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).