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㉑ Applicant: **COLIBRI LIGHTERS LIMITED, Colibri**
House 69 Warren Street, London, W1P 6AD (GB)

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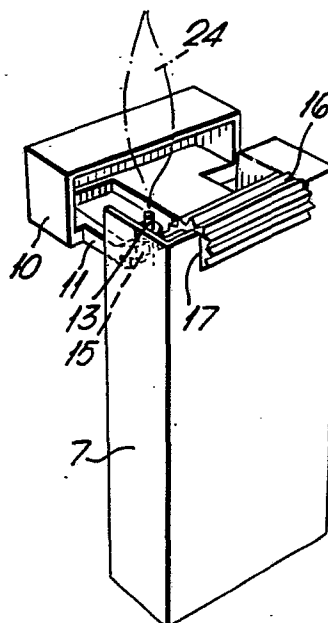
㉒ Inventor: **Lowenthal, Hans, Flat 6 7 Sheffield Terrace,**
London, W.8 (GB)

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㉗ Representative: **Jackson, Peter Arthur et al, GILL**
JENNINGS & EVERY 53 to 64, Chancery Lane, London
WC2A 1HN (GB)

㉙ **Smokers' lighter.**

㉚ A lighter of elongate shape as seen from above has a flint ignition mechanism operated by a roller actuator (16) which is mounted with its axis horizontal and extending across the broader face of the lighter shell adjacent to a burner-covering lid (10).



- 1 -

COLIBRI LIGHTERS LIMITED

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SMOKERS' LIGHTER

The invention relates to a smokers' lighter of the kind with a flint ignition mechanism operated by a roller actuator. In the present context the term "roller actuator" means a roller which is rotated by
5 direct application of the user's thumb or finger to the surface of the roller, the roller having an effective length which is greater than its diameter and generally greater than 10 mm. The roller may have a serrated surface to assist the frictional entrainment of the
10 roller by the user's thumb or finger. Rotation of the roller rotates a flint wheel which is conventionally mounted coaxially with the roller.

Lighters of this kind are usually of the so-called "box type" in which a lid complements a body part of the
15 lighter to form a substantially closed prismatic box. The lid, together with the rest of the body, is usually elongate as seen in plan and the lid is hinged to the body part about an axis extending across the lower part of one narrower end of the lid. The roller actuator for the
20 ignition mechanism is let into one vertical corner or side edge of the body part. To operate this lighter the lid is swung upwards from its normal horizontal position overlying the burner, through an angle of between 70° and 90°, to reveal a burner and, in the case of a gas
25 burning lighter, usually also automatically to open a burner valve, or to allow the burner valve to open, to

allow gas to escape through the burner ready for ignition. The fuel is subsequently ignited by drawing the thumb across the roller actuator, thereby rotating a flint wheel at the upper end of the roller, to direct
5 a stream of sparks towards the burner.

One inherent disadvantage of lighters of this construction is that a recess has to be cut into a vertical corner or side edge of the lighter body to accommodate the majority of the cross section of the roller
10 actuator. The cutting of this recess, and the provision at the lower end of the recess of a bearing for the lower end of the roller actuator, are costly production steps. Furthermore, the letting of the roller actuator into the lighter body reduces the
15 available space for the fuel reservoir tank, and if the remaining space is to be used to maximum advantage, requires that the fuel reservoir tank be shaped to lie closely around the roller actuator. Even when
20 the tank is formed by drilling out a solid body part, made for example of an aluminum alloy, such complex shaping is expensive to produce. Unless the shaping of the tank is exceptionally complex, so as to underlie the bottom of the roller actuator, the space unavailable for the fuel reservoir tank will consist of substantially
25 the full cross section of the roller actuator throughout the whole height of the body part.

A further disadvantage inherent in the conventional box type lighters with roller actuators is that, since
30 the roller actuator and flint wheel are rotatable about the vertical axis, the flint tube which accommodates the flint and flint spring must be mounted substantially horizontally, and is therefore limited in length to a maximum of a longer dimension of the lid and body part. As a result only a short flint spring can be accommodated,
35 resulting in an appreciable change in the force urging

- 3 -

the flint against the flint wheel as the flint is used up. The positioning of the flint tube across the top of the body part has to be accommodated by appropriate shaping of the top of the fuel tank and imposes limitation on the design of the burner and adjacent parts.

Conventional box type lighters have two further disadvantages associated with their lid mounting. First, the lid is most conveniently raised by gripping the body part between the four fingers and the palm of one hand and applying the thumb to the end of the lid remote from that at which it is hinged. As a result, the user is able to apply a considerable leverage to the lid owing to the moment arm of the applied reaction being more or less the same as the longer dimension of the lid. The lid movement resulting from this leverage has to be guided by a comparatively short hinge extending across the shorter dimension of the lid. This guidance is not always sufficient to protect the hinge against damage, particularly if the user handles the lighter roughly, for example by inadvertently trying to push the lid open past its normal limited fully open position, or by additionally applying a lateral force component on the lid tending to twist the lid in a direction parallel to its hinge axis. Consequently the lid hinge is a component which is frequently overstrained and experience shows that many lighters are returned for repair owing to hinge damage.

Secondly, the lid is only free to swing upwards through an angle of about 80° . An angle of greater than this involves a more complex hinge and a more complex abutment arrangement to allow the opening movement of the lid. However, since the lid lies, in the open position, with its longer dimension extending upwards alongside the burner, and indeed usually inclined slightly towards the burner, the flame plays

on the lid if the lighter is tilted in one direction, which frequently happens when a light is being offered to another person. The lid then partly obscures the flame which is inconvenient. Also the frequent playing
5 of the hot flame on the lid may lead to unpleasant sooty deposits on the lid where it has to be handled, and may damage any embellishment to the lid. Furthermore the flame is not as conveniently exposed as it might be, especially for lighting pipes.

10 In accordance with the present invention, in a smokers' lighter of the kind with a flint ignition mechanism operated by a roller actuator, the lighter has a nominally upper part incorporating both a burner
15 cover and the roller actuator which is mounted with its axis extending substantially horizontally when the lighter is oriented with its nominally upper part uppermost; a cross section through the upper part in a plane defined by the axis of the roller actuator and any horizontal line perpendicular to the axis of the
20 roller actuator being elongate, and the axis of the roller actuator extending in the longitudinal direction of the section; and the burner cover being movable away from the roller actuator substantially transversely to the axis of the roller actuator to reveal a burner,
25 after which rotation of the roller actuator is arranged to produce sparks to ignite fuel of the burner.

Most lighters, be they pocket or table lighters, have a flat bottom surface on which they may be stood, so that it is clear which is the upper part of the
30 lighter. However, in lighters of exotic shape with no flat bottom surface, the invention is defined in terms of that part of the lighter at which the burner cover is provided being considered nominally as the upper part of the lighter.

35 The roller actuator is defined as being mounted

- 5 -

with its axis extending substantially horizontally. In the context this term "substantially horizontally" is not intended to preclude the possibility that the axis is inclined to the horizontal provided that the axis is nearer to the horizontal than to the vertical and preferably within 30° of the horizontal when the lighter is oriented with its upper part at the top. In such orientations the flame may be directed from the burner, particularly in the case of a gas burning cigarette. lighter, in any appropriate direction, for example vertical, horizontal, or in any intermediate direction.

The burner cover will usually be elongate in the direction parallel to the axis of the roller actuator, but in any case, in a closed position, will lie over and/or alongside the roller actuator substantially abutting the cylindrical mantle of the roller actuator, preferably over the whole length of the roller actuator. Also, the roller actuator will usually be mounted with its axis offset to one longer side of the elongate section so as to be readily operable from one of the wider sides of the upper part. A particularly convenient construction is provided if the majority of the cross section of the roller actuator is recessed into the lighter and is framed by parts of a shell of the lighter. The roller actuator thus protrudes only a little from the shell of the lighter in the closed position but, upon opening of the burner cover, is readily accessible for application of the user's thumb.

The construction in which the roller actuator is mounted with its axis extending substantially horizontally across the upper part of the lighter and with the burner cover being movable substantially transversely to the axis of the roller actuator overcomes the majority of the disadvantages referred to in connection with previous lighters. Thus the roller actuator does not

have to be mounted in a recess cut into the lighter body part way down the body, but may be positioned along an upper edge of the lighter body. The body may then be made more cheaply than hitherto and the fuel reservoir tank may be made larger and of simpler shape. A further advantage is attained that the flint tube may extend substantially vertically down through the lighter body. Since this is likely to be the longest dimension of a lighter body, it enables a long flint spring to be used. It should be noted that a conventional flint tube has a diameter considerably less than that of a conventional roller actuator so that the extension of the flint tube down through the lighter body does not significantly affect the tank capacity or shaping. The substantially vertical flint tube also frees the top of the lighter body to accommodate the burner, burner cover and roller actuator without having to take account of the full length of the flint tube. In a gas lighter, the conventional flame height regulator passage may also run vertically through the lighter body parallel to the flint tube.

Although the burner cover may be mounted in any convenient manner so that it is movable away from the roller actuator substantially transversely to the axis of the roller actuator, the burner cover is most conveniently pivotally mounted about an axis extending substantially parallel to the axis of the roller actuator. When the burner cover is elongate, as is preferred, the burner cover hinge can then virtually extend along the full length of the longer dimension of the burner cover, thereby minimizing the previous potential hinge damage problem. Also the leverage which the user can apply upon rocking the burner cover to the open position will have a moment arm of the order of magnitude only of the shorter dimension of the

- 7 -

burner cover. Further, if the burner cover is only rocked through 90° or less from the rest position, only its shorter dimension will extend upwards alongside the flame where it is unlikely to obstruct the flame. The arrangement also provides an ergonomically more efficient way of operating the lighter by placing the thumb against the burner cover, pushing it away a relatively short distance to reveal the burner, and then bringing the thumb back onto the roller actuator, continuing the movement to rotate the actuator. The distance which the burner cover is pushed away may be very short if an over centre spring arrangement is provided to cause the burner cover to snap to a fully open position once it has been manually pushed past a central position. In an alternative construction, instead of being moved manually, the burner cover is movable away from the roller actuator under spring action after being released by, for example, a release button. Since the centre of gravity of the burner cover is closer to the hinge axis than in a conventional box lighter in which the lid is hinged across one narrower end, the burner cover can swing open under the spring action and the movement arrested by an abutment without undue strain on the burner cover hinge.

The invention is particularly applicable to a lighter of the kind in which the burner cover and a body of the lighter containing a fuel reservoir tank complement one another to form a closed shell with curved or flat surfaces. At least the upper part of the shell will then have the elongate section. The roller actuator may then be mounted at the natural break between the body and cover and will be partly concealed by the burner cover when the cover is in its closed position. Thus the roller is effectively embedded in the shell but visible between the body and burner cover

by which it is fully surrounded, with the roller slightly protruding from the surface of the lighter. A particular form of such construction is a lighter of the box type, i.e. the shell is of a substantially rectangular prismatic shape, in which case the roller actuator will be mounted across the top of a broader side of the lighter body and may be received within a recess formed in the upper edge of the body and/or lower edge of the lid where the lid meets the body on a broader face of the box.

The roller actuator may be a single serrated roller or divided coaxial roller parts which rotate together. However, in either case, the effective length, that is to say the aggregate axial length of the part or parts to which the rotary reaction may conveniently be applied by the user's thumb or finger, will be greater than the diameter of the roller.

When the invention is applied to a box type lighter the roller actuator may be off centre with respect to a broad side face of the body but is preferably arranged centrally with respect to such face. The flint wheel and burner may then be offset at one end or the other, as seen in plan, of the body but the burner may also be centrally situated. Such a symmetrical arrangement would be equally convenient for left or right handed users. The flint wheel will normally be substantially opposite to the burner so that if the burner is centrally positioned, a construction in which two roller parts are mounted one each side of a central, possibly covered, flint wheel, would be convenient.

The invention is equally applicable to table lighters, particularly of the kind in which a standard insert, usually cylindrical, is fitted into a socket in the top of any one of a range of ornate outer bodies. In such case the burner cover and roller actuator will be

mounted on top of the insert and may provide the upper part of elongate section, although at least the upper part of the insert itself may also have the elongate section. The horizontal positioning of the roller
5 actuator makes this possible whereas the conventional vertical roller arrangement is impracticable with standard table lighter inserts.

Two examples of lighters constructed in accordance with the present invention are illustrated diagrammatically in the accompanying drawings, in which:-
10

Figures 1 and 2 are perspective views showing a box type pocket lighter prior to and upon operation, respectively;

Figures 3 and 4 are sections taken on the lines
15 III-III and IV-IV, respectively, in Figure 1; and,

Figures 5 and 6 are views similar to Figures 1 and 2 but showing a table lighter insert.

The lighter shown in Figures 1 to 4 has a main body part with a housing 7 containing, below an integral
20 cross wall 8, a reservoir tank 9 for liquefied gaseous fuel. A hinged lid 10, having a burner cover, is carried by an arm 11 and is hinged by a hinge pin 12 to the housing 7. In the closed position shown in Figure 1 and in full lines in Figure 3, the lid 10 with its arm
25 11 complement the housing 7 to form a substantially closed rectangular prismatic shell.

Mounted in the top of the tank 9, and extending upwardly from the cross wall 8 is a conventional burner valve and nozzle assembly 13 provided with an annular
30 projection 14. An extension of the arm 11 beyond the pin 12 is formed as a cam 15. When the lid 10 is closed, the cam 15 is clear of the projection 14 and the stem of the burner assembly above the cross wall 8 is drawn down under internal spring action to close the valve. When
35 the lid 10 is moved to its open position, shown in dotted

lines in Figure 3, the cam 15 engages the under surface of the projection 14 to lift the stem, thereby opening the valve and allowing fuel gas to be discharged through the burner nozzle. The lid 10 may be provided with a
5 conventional overcentre spring to hold it in its closed position.

A roller actuator 16 is mounted in a rectangular slot formed in the upper edge of one broader face of the body housing 7. The corresponding edge of the lid 10
10 substantially abuts the roller actuator in the closed position so that, as shown in Figure 3, only a small portion of the periphery of the roller actuator protrudes from the surface of the shell. As shown in Figure 1, the roller actuator is framed by adjacent parts of the
15 shell.

The roller actuator 16 is fixed on a shaft 17 the ends of which are each rotatably mounted in a blind bore in a screw 18 which is inserted through the housing 7 and screws into a nut 19 engaging the inner wall of the
20 housing. At the left hand end, as seen in Figure 4, the projecting end of the roller actuator is stepped down and has non-rotatably keyed upon it a flint wheel 20. The flint wheel cooperates with a flint 21 in a conventional flint tube 22 extending down through the reservoir
25 tank 9 and accommodating the conventional flint spring and piston 23.

It will be apparent that the lighter is operated by grasping the lighter so that the user's thumb overlies the broader face of the shell at which the roller
30 actuator 16 is exposed. The thumb is pushed upwards to open the lid and hence the burner valve, and is then drawn backwards over the roller actuator 16 to direct a stream of sparks from the flint 21 to the burner nozzle to ignite a flame 24. The flame is extinguished by
35 reclosing the lid 10.

The table lighter insert shown in Figures 5 and 6 is similar in general layout to that of Figures 1 to 4. In this case the body housing 7A forms a cylindrical insert for reception within an outer ornate body part.

5 The roller actuator 16A is rotatably mounted in a U-shaped block 25 which forms a sub-assembly with a flint tube 22A. A burner cover 10A is pivotally mounted about an axis 12A on an upstanding portion of the body. In the closed position shown in Figure 5, the burner

10 cover 10A partly overlies and substantially abuts the roller actuator 16A, and abuts the block 25, to form a closed chamber containing a burner nozzle 27 which opens through the portion 26 and is associated with a burner valve opened in conventional fashion by the

15 opening movement of the lid 10A. The lighter is operated in the same manner as that of Figures 1 to 4.

In both the illustrated examples, the flint tubes 22 and 22A and the reservoir tanks are replenished from the bottom of the main body parts. Flame height

20 adjustment is also carried out from the bottom of the lighters through a conventional tube which runs vertically through the body, adjacent to the flint tube and below the burner assembly.

- 12 -

CLAIMS

1. A smokers' lighter of the kind with a flint ignition mechanism operated by a roller actuator (16), the lighter having a nominally upper part incorporating both a burner cover (10) and the roller actuator which
5 is mounted with its axis extending substantially horizontally when the lighter is oriented with its nominally upper part uppermost; a cross section through the upper part in a plane defined by the axis (17) of the roller actuator and any horizontal line perpendicular to the
10 axis of the roller actuator being elongate, and the axis of the roller actuator extending in the longitudinal direction of the section; and the burner cover being movable away from the roller actuator substantially transversely to the axis of the roller actuator to
15 reveal a burner, after which rotation of the roller actuator is arranged to produce sparks to ignite fuel at the burner (13).
2. A lighter according to claim 1, in which the burner cover is elongate in the direction parallel to
20 the axis of the roller actuator.
3. A lighter according to claim 1 or claim 2, in which the burner cover is pivotally mounted about an axis (12) extending substantially parallel to the axis (17) of the roller actuator.
- 25 4. A lighter according to any one of the preceding

claims, in which the roller actuator is mounted with its axis offset to one longer side of the elongate section so as to be readily operable from one of the wider sides of the upper part.

- 5 5. A lighter according to any one of the preceding claims, in which, in a closed position, the burner cover lies over and/or alongside the roller actuator substantially abutting the cylindrical mantle of the roller actuator.
- 10 6. A lighter according to claim 5, in which the burner cover substantially abuts the mantle over the whole length of the roller.
7. A lighter according to claim 5 or claim 6, in which the majority of the cross section of the roller
15 actuator is recessed into the lighter and is framed by parts of the lighter.
8. A lighter according to claim 7, in which the burner cover and a body of the lighter containing a
 fuel reservoir tank (9) complement one another to form
20 a closed shell, the roller actuator being mounted at the natural break between the body and cover.
9. A lighter according to claim 8, in which the shell is of substantially rectangular prismatic shape
 and the roller actuator is mounted across the top of a
25 broader side of the lighter body.
10. A lighter according to claim 9, in which the roller actuator is mounted centrally along the broader side.

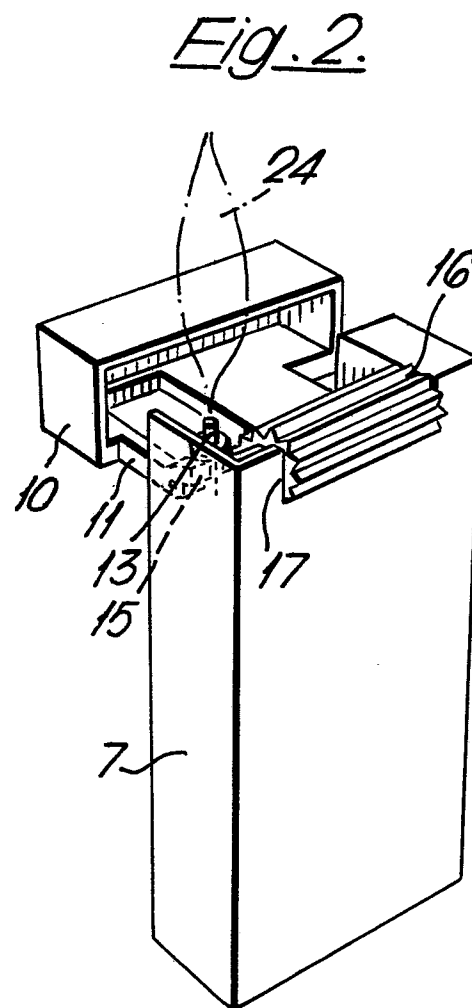
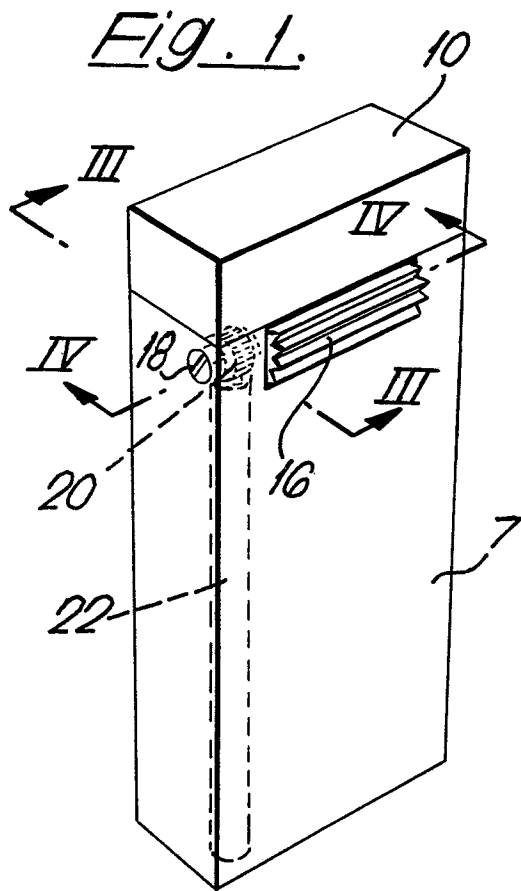


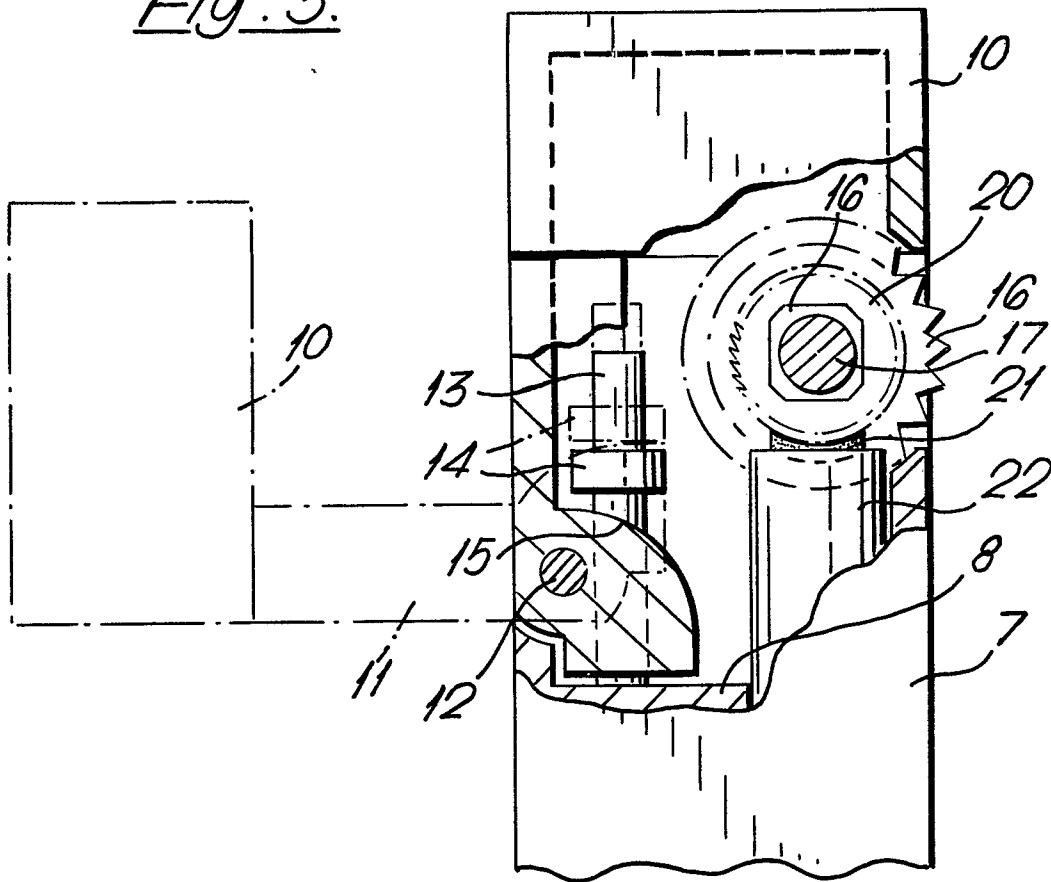
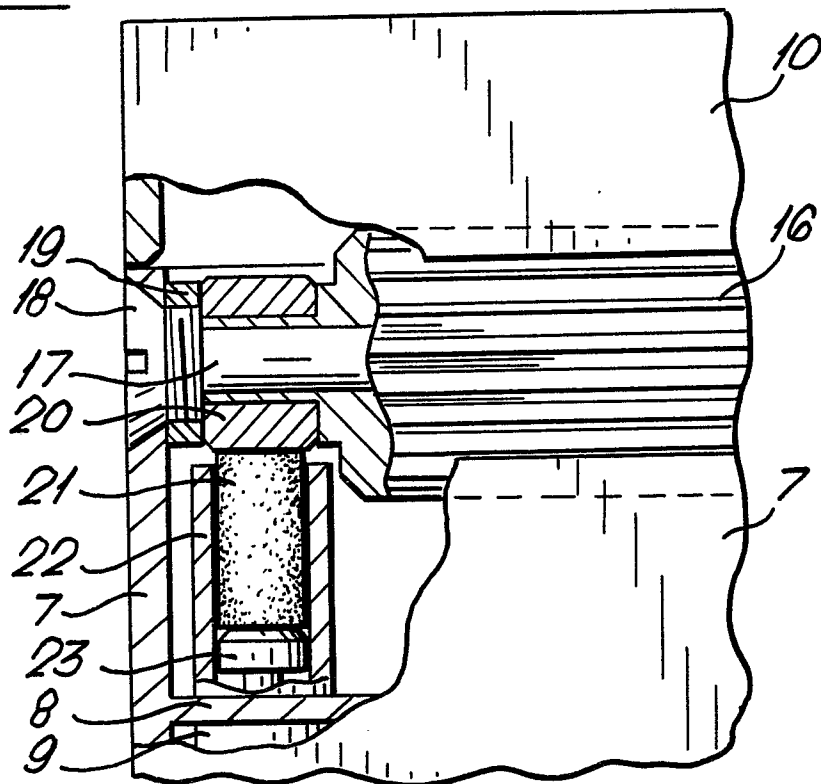
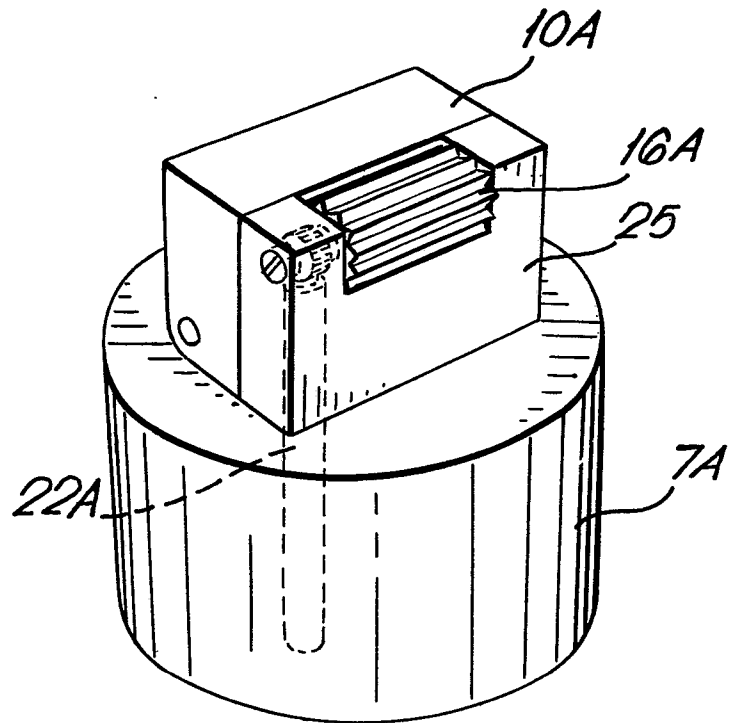
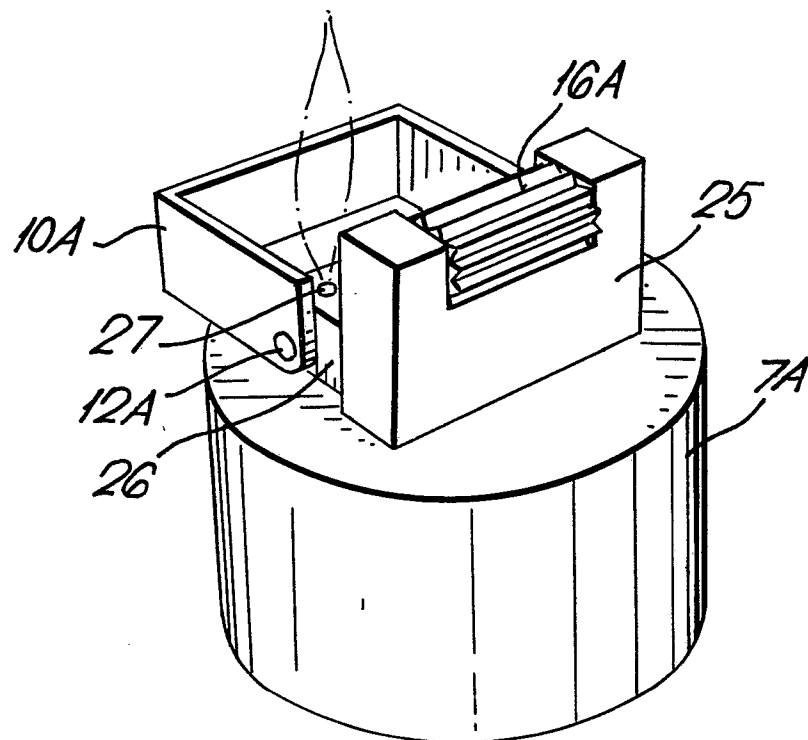
Fig. 3.Fig. 4.

Fig. 5.Fig. 6.



European Patent
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EUROPEAN SEARCH REPORT

0043677

Application number

EP 81302868.5

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	AT - B - 349 252 (LA NATIONALE S.A.) * Page 2, lines 26-48; fig. 1,2 * --	1-3,5, 6,8,9	F 23 Q 2/16 F 23 Q 2/36 F 23 Q 2/40
A	DE - B - 1 547 661 (ZAHN) * Totality * --	1,6,8	
X	DE - A - 2 240 755 (HORIKOSHI-KOGYOO CO) * Totality * --	1-3,5, 6,8,9	TECHNICAL FIELDS SEARCHED (Int. Cl.)
A	DE - A - 2 341 495 (CONSUL GMBH) * Page 5, lines 1-17; fig. 1 * --	1	F 23 Q 2/00
A	FR - A - 2 130 219 (MANSEI KOGYO) * Totality * --	1-4,7	
X	GB - A - 1 331 989 (GENOUD & CIE) * Totality * ----	1-3,5, 6,8,9	
			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
X	The present search report has been drawn up for all claims		&: member of the same patent family, corresponding document
Place of search VIENNA		Date of completion of the search 13-10-1981	Examiner WITTMANN