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(72) Inventor: **Willis, Colin Petert**
Wilenhall, West Midlands WV12 4QH (GB)

(74) Representative: **Tart, Keith Raymond**
Four Oaks Patents Ltd.
162 Walsall Road
Four Oaks
Sutton Coldfield, W Mids B74 4RD (GB)

(71) Applicant: **Wills, Colin Peter**
West Midlands WV12 4QH (GB)

(54) A ceiling mount assembly

(57) An improved ceiling mount assembly (10) for supporting a connected electrical device so that it can be temporarily lowered from a ceiling to facilitate servicing comprising: an upper member (12); a lower member (14); and a tether line (18), the first end of which is connected to a mechanical (non-motorised) extension/retraction

unit (16) within the upper member (12; and the second end of which is attached to the lower member (14); such that in use when said electrical device (E) is mounted underneath the lower member, both may together be raised or lowered relative to the upper member that is fixed to the ceiling (C).

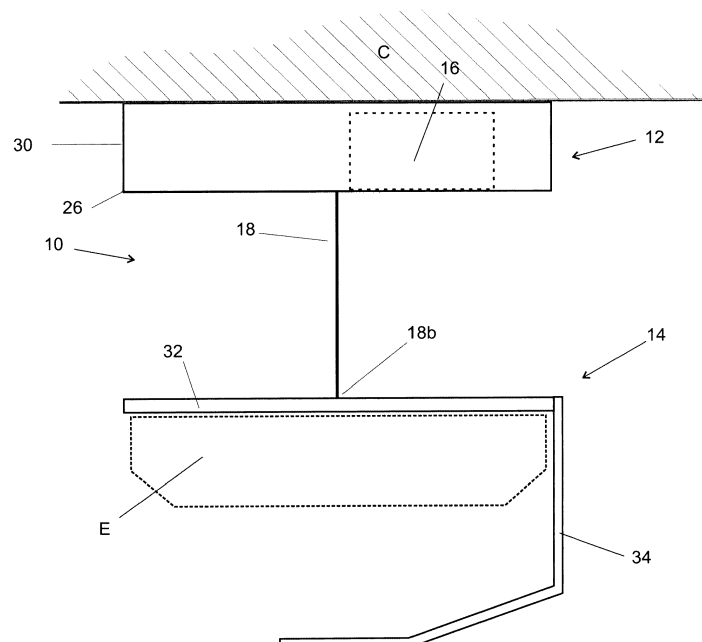


Figure 1

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Description

Technical Field

[0001] The present invention provides a ceiling mount assembly that in use supports an electrical device (in particular; a smoke detector/alarm) such that in use the electrical device can be temporarily lowered from the ceiling to allow testing and servicing.

Background Art

[0002] Electrical devices such as smoke detector/alarms; carbon monoxide detector/alarms and emergency (battery powered) lights are frequently mounted on room ceilings. Such devices need to be periodically tested and serviced; the latter normally involves replacement of one or more batteries. These activities often require that the person undertaking the testing/servicing stand on ladders or the like in order to reach the electrical device. This can be inconvenient and hazardous - especially for elderly or disabled people. Consequently, smoke detector/alarms and carbon monoxide detector/alarms etc., may become inactive owing to lack of such testing/servicing. This places lives at risk. Surveys have shown that 50% or more of cases of such devices failing are due to missing or flat batteries.

[0003] Devices are known that address this problem. These are often quite complex and generally require the purchase of a new detector/alarm unit and mount.

Disclosure of Invention

[0004] An aim of the present invention is to provide improved means of (apparatus for) temporarily lowering electrical devices from a ceiling to facilitate servicing. Another aim is to provide such apparatus that can be used with an existing smoke detector/alarm or carbon monoxide detector/alarm. Further aims are to provide a mechanically simple apparatus; that may be placed between an existing smoke or carbon monoxide detector/alarm ceiling mount and the main body of such a detector/alarm (that contains the actual detector).

[0005] In one aspect the invention comprises a ceiling mount assembly for supporting beneath said assembly a smoke or toxic gas detector/alarm assembly or a battery powered emergency light (E) said ceiling mount assembly comprising: an upper member that in use is attached indirectly to a ceiling surface (C); and a lower member; a tether line a first end of which is connected to a non-motorised mechanical extension/retraction unit within said upper member and wherein a second end is fixed to said lower member, or a portion of said tether line passes through an eye/aperture formed in a part of said lower member; such that in use when said smoke or toxic gas detector/alarm assembly or a battery powered emergency light (E) is mounted underneath said lower member, both said smoke or toxic gas detector/alarm assembly

or a battery powered emergency light (E) and said lower member may together be raised or lowered relative to said upper member that is fixed to said ceiling; and wherein said upper member is configured to engage a ceiling fixing plate (E1) of said smoke or toxic gas detector/alarm assembly (E) or a battery powered emergency light and the lower member is configured to engage a main body portion (E2) thereof that contains a sensor/detector or emergency light.

[0006] In another aspect the invention comprises a ceiling mount assembly for supporting beneath said assembly a connected electrical device said assembly comprising: an upper member that in use is attached directly or indirectly to said ceiling; and a lower member; a tether line the first end of which is connected to a mechanical (non-motorised) extension/retraction unit within said upper member and wherein the second end is fixed to said lower member, or a portion of said tether line passes through an eye/aperture forming part of said lower member; such that in use when said electrical device is mounted underneath said lower member, both said electrical device and lower member may together be raised or lowered relative to said upper member that is fixed to said wall/ceiling, thus assisting servicing of said electrical device. The upper member may be attached indirectly to a ceiling using an additional fixing member adapted for fixing directly to a ceiling below which (in use) the upper member is attached/inserted and held in place by conventional fixing means; for example using male female elements.

[0007] Preferably, the electrical device is a smoke or toxic gas detector/alarm. However, the device may also be a light fitting/assembly; for example, a battery powered emergency light assembly.

[0008] In some cases, the above ceiling mount may be adapted for use with a conventional smoke or toxic gas detector/alarm assembly such that said upper member may be configured to engage the ceiling fixing plate of said conventional detector/alarm assembly; in which case the lower member is configured to engage the main body thereof that contains the sensor/detector.

[0009] In another aspect the invention comprises a ceiling mount assembly for supporting beneath said assembly a connected electrical device (E) said assembly comprising: an upper member that in use is attached directly or indirectly to a ceiling (C); and a lower member; a tether line a first end of which is connected to a non-motorised mechanical extension/retraction unit within said upper member and wherein a second end is fixed to said lower member, or a portion of said tether line passes through an eye/aperture formed in a part of said lower member; such that in use when said electrical device (E) is mounted underneath said lower member, both said electrical device (E) and said lower member may together be raised or lowered relative to said upper member that is fixed to said ceiling (C); where the extension/retraction unit comprises a reel rotationally mounted such that in use it rotates about an axis that is generally per-

pendicular to the ceiling surface (C) to which it is fixed.

[0010] Preferably, in all of the above aspects, the second end of the tether line is fixed to the lower member. However, an alternative is for the tether line to pass through a threading member attached to the lower member; in which case the second end of the tether line may also be fixed to the underside of the upper member. In this case when the ceiling mount is extended the tether may have a "V-shape". A portion of said tether line may pass through an eye/aperture forming part of said lower member and the second end of the tether line is fixed to the upper member.

[0011] Preferably, in all of the above aspects, the extension/retraction unit comprises a reel rotationally mounted such that in use it rotates about an axis that is generally perpendicular to the ceiling surface to which it is fixed. The ceiling mount may further comprise a guide member or roller that facilitates a 90° change in direction of the tether line at it is extended or retracted.

[0012] Preferably, in all of the above aspects, a ratchet mechanism is provided within the retraction mechanism in order to prevent premature retraction of the tether line. The lower assembly may further comprises an arm or loop that may in use be engaged by a pole with a hook in order to lower the electrical device and attached lower member.

[0013] While (in use) in all of the above aspects, the axis of rotation of the wheel is preferably perpendicular to the surface of the ceiling, this axis may be parallel; in which case a tether line guide member or the like is not required; however this will result in a deeper upper member and hence the electrical member being held slightly further below the ceiling level; which may be undesirable when the device is a detector/alarm. While the first and second members that are typically disc-shaped (plan view), this is not an essential feature of the invention; for example, these members may be generally rectangular or polygonal in shape (plan view). They may also be manufactured from any suitable metallic or non-metallic (e.g. plastics) material.

[0014] The present invention may comprise a method of raising or lowering a smoke or toxic gas detector/alarm assembly (E) or a battery powered emergency light from a ceiling (C) using an assembly according to any preceding claim wherein when the assembly is in a fully raised position said ceiling mount assembly is sandwiched between a/the ceiling fixing plate (E1) of a conventional detector/alarm assembly or a battery powered emergency light and a/the main body (E2) thereof.

Brief Description of the Drawings

[0015] The following diagrammatic drawings illustrate salient features of the present invention; where:

Figure 1 shows a side view of a ceiling mount assembly according to a preferred embodiment of the present invention carrying an electrical device (E),

in a partly extended position;

Figure 2 shows a plan view of the upper member of the ceiling mount illustrated in Figure 1;

Figure 3 shows an underside view of the lower member of the ceiling mount illustrated in Figure 1;

Figure 4 is shows a side elevation in cross section (along the line B-B') of the upper member of the ceiling mount illustrated in Figure 1;

Figure 5 shows the ceiling mount assembly of Figure 1 (with an attached electrical device E) in a fully retracted position;

Figure 6 shows the ceiling mount assembly (with an attached electrical device E2) in a fully retracted position with an additional fixing member (E1) located between the ceiling and the upper member; and

Figure 7 shows a side view of a ceiling mount assembly according to a further embodiment of the present invention, carrying an electrical device (E); in a partly extended position; where the tether line is attached at the second end to the first member.

Detailed Description of the Invention

[0016] Figures 1-6 show diagrammatically a preferred embodiment of the present invention.

[0017] The ceiling mount (10) comprises an upper member (12) and a lower member (14). Figures 1 and 4 show side views of the upper member (12); this houses a mechanical (non-motorised) retraction mechanism (16) that comprises: a tether line (18); a reel (20) which is rotateably mounted so that in use it rotates about an axis B-B' (see Figure 4) that is generally perpendicular to the plane of the ceiling surface (C); a helical spring mechanism (not shown) contained within a housing (36) below the reel (20); a roller (24) or rounded face that facilitates an approximately 90° change in direction of the tether line (18) as it is extended or retracted. All of these items are contained within an outer case (26) of the upper member (12) that has a small circular aperture (28) in its lower face. The lower face is typically disc-shaped and has an adjoining short-cylindrically shaped side wall (30).

[0018] A first end of the tether line (18) is attached to the reel (20) of the mechanical retraction mechanism (16, 20) and the other end of which is attached to the lower member (14) of the ceiling mount (10).

[0019] The lower member comprises a disc-shaped flat plate (32) which has a pull-arm (34) attached thereto.

[0020] Figure 1 shows the upper member (12) attached directly to a ceiling (C).

[0021] Figure 1 also shows an electrical device (E) attached to the underside of the disc-shaped flat plate (32). Typically, this device (E) will be a smoke detector with

combined audible alarm or a carbon monoxide detector with a combined audible alarm. Such devices are widely used to protect occupants of commercial and domestic buildings from injury. Some such devices are designed to be screwed onto a ceiling surface, while others are detachable from a (separate) mount that is fixed to the ceiling. In the latter case the detector/alarm part typically has means of engaging the mount; for example by insertion and part turning of a male part within a female recess in the mount.

[0022] The lower surface of the disc-shaped flat plate (32) may contain an array of small circular apertures (not shown) to facilitate bolting detector/alarms with various (bolt) fixing configurations. Alternatively (or additionally), the flat plate (32) may have engagement means that allow an alarm/detector to be attached by other conventional means such as push fit (male to female) means which require partial rotation to lock the alarm/detector to the underside of the flat plate (32).

[0023] Figure 1 shows the ceiling mount in a partly extended position. Typically, the tether line (18) will be long enough to allow the lower member to be extended by 0.5-1.5 metres. This degree of extension is provided to allow the electrical device (E) to be accessed at waist-level by a user.

[0024] In use, the ceiling mount is normally in a fully retracted position, as shown in Figure 5. If the mount is being used with a smoke detector/alarm or a carbon monoxide detector/alarm the owner (or other person responsible) will need to periodically test that the device is in good working order (normally by depressing a test button and awaiting a visual/audible alarm) and also periodically renew the batteries that power such detector/alarms. When this is necessary, a pole with a loop/hook at one end can be used; the loop/hook end of the pole being used to engage part of the pull arm (34) of the lower member. When thus engaged the pole is used to pull the lower member (14) in a downward direction so that it separates from the upper member (12); during this action the tether line (18) extends by unwinding from the reel (20); the reel rotating about the axis B-B' with a helical spring (not shown); contained in a housing (36) below said reel (20) configured so that during this unwinding (extension) the helical spring becomes tensioned. After the detector/alarm has been serviced the tensioned spring (not shown) ensures that the tether retracts and is wound back onto the reel (20). Preferably, the retraction mechanism (16,20,36) includes a ratchet (or the like) that prevents such retraction until the tether is pulled downwardly (a second time) by a small distance.

[0025] The means by which the upper member is directly attached to a ceiling may be entirely conventional. Figure 6 shows that the upper member (12) of the ceiling mount (10) may be fixed indirectly to a ceiling (C) using an intermediate fixing member (E1). This is typically part of an existing detector/alarm (E) - for example; an alarm/detector (E) where the active components of the alarm detector (E2) are encased separately from the fix-

ing member portion (E1); and in use the upper member (12) is attached to the fixing member (E1) after it has been attached to a ceiling. Alternatively, a fixing member (E1) of this type may form part of the ceiling mount of the present invention.

[0026] Figure 7, shows a further embodiment of the invention which only differs from the preferred embodiment described above in that the second end (18b) of the tether line (18) is attached to the upper member (12) and the tether line passes (18) through an eye (38) fixed to or integral with the flat plate (32) of the lower member. In order to facilitate this arrangement the circular aperture (28) in the lower face of the outer case (26) is repositioned as is the position of the reel (not shown) and roller (not shown) or rounded face. Alternatively, the flat plate (32) may contain two eyes (not shown) through which the tether line (18) passes. This results in the tether line (18) being "U-shaped" rather than "V-shaped" (as shown in Figure 7) when the mount is in a partly or fully extended position.

[0027] While Figures 2 and 3 depict first and second members that are disc-shaped, this is not an essential feature of the invention; for example, these members may be generally rectangular or polygonal in shape (plan view).

Claims

1. A ceiling mount assembly (10) for supporting beneath said assembly a smoke or toxic gas detector/alarm assembly or a battery powered emergency light (E) said ceiling mount assembly (10) comprising: an upper member (12) that in use is attached indirectly to a ceiling surface (C); and a lower member (14); a tether line (18) a first end of which is connected to a non-motorised mechanical extension/retraction unit (16) within said upper member (12) and wherein a second end is fixed to said lower member (14), or a portion of said tether line (18) passes through an eye/aperture formed in a part of said lower member (14); such that in use when said smoke or toxic gas detector/alarm assembly or a battery powered emergency light (E) is mounted underneath said lower member (14), both said smoke or toxic gas detector/alarm assembly or a battery powered emergency light (E) and said lower member (14) may together be raised or lowered relative to said upper member (12) that is fixed to said ceiling (C); and wherein said upper member (12) is configured to engage a ceiling fixing plate (E1) of said smoke or toxic gas detector/alarm assembly (E) or a battery powered emergency light and the lower member (14) is configured to engage a main body portion (E2) thereof that contains a sensor/detector or emergency light.
2. A ceiling mount (10) according to Claim 1 where said

tether line (18) passes through the eye/aperture formed in a part of said lower member (14) and the second end (18b) of the tether line is fixed to the upper member (12).

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3. A ceiling mount (10) according to Claim 1 or 2 where the extension/retraction unit (16) comprises a reel (20) rotationally mounted such that in use it rotates about an axis that is generally perpendicular to the ceiling surface (C) to which it is fixed. 10
4. A ceiling mount (10) according to Claim 3 further comprising a guide member or roller (24) that facilitates a 90° change in direction of the tether line (18) at the ceiling mount assembly (10) is extended or retracted. 15
5. A ceiling mount according to any preceding claim where a ratchet mechanism is provided in order to prevent premature retraction of the tether line (18). 20
6. A ceiling mount (10) according to any preceding claim where the lower assembly (14) further comprises an arm or loop (34) that may in use be engaged by a pole with a hook in order to lower the smoke or toxic gas detector/alarm assembly (E) or battery powered emergency light and the attached lower member (12). 25
7. A method of raising or lowering a smoke or toxic gas detector/alarm assembly (E) or a battery powered emergency light from a ceiling (C) using an assembly according to any preceding claim wherein when the assembly (10) is in a fully raised position said ceiling mount assembly (10) is sandwiched between a/the ceiling fixing plate (E1) of a conventional detector/alarm assembly or a battery powered emergency light and a/the main body (E2) thereof. 30
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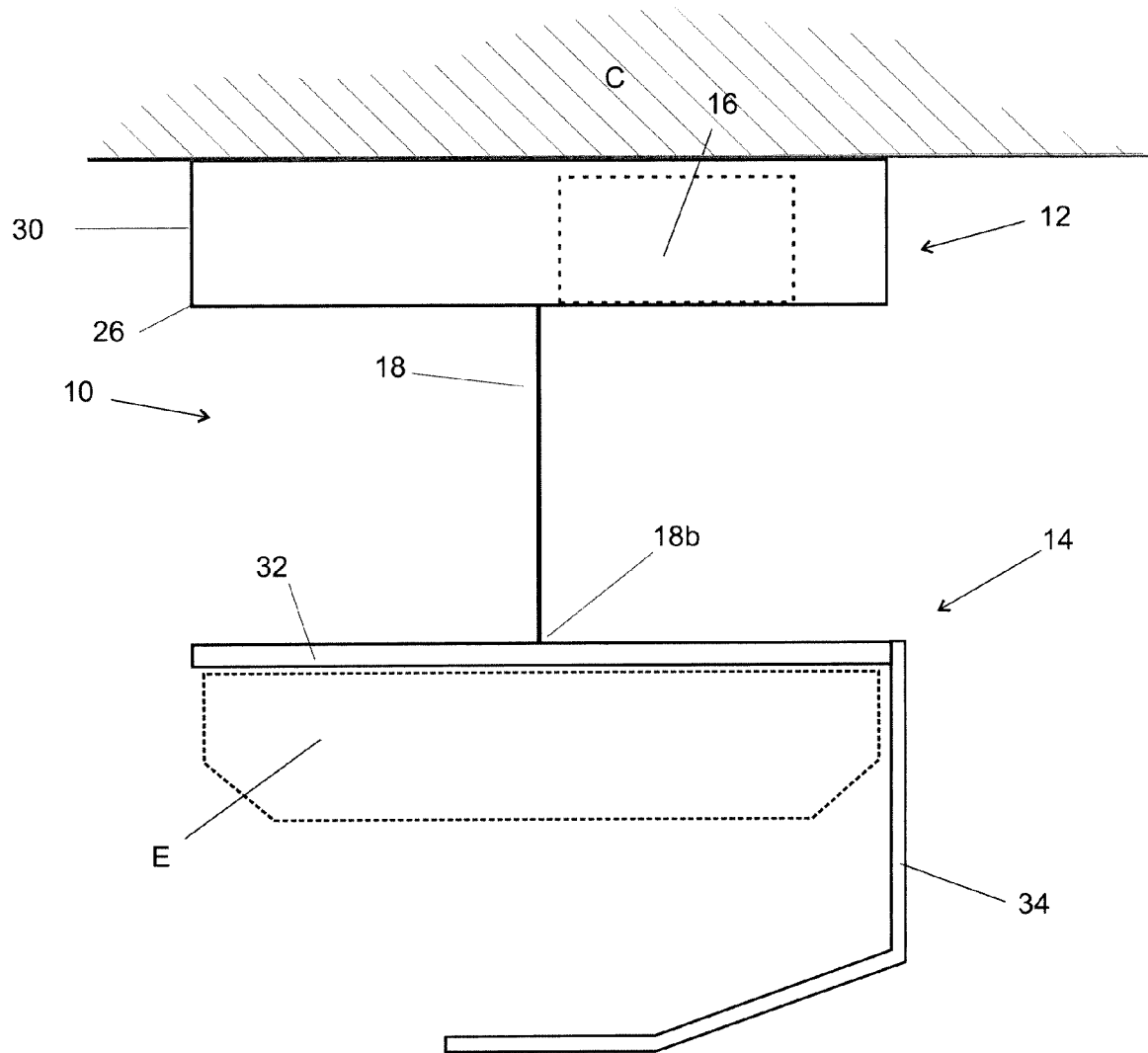


Figure 1

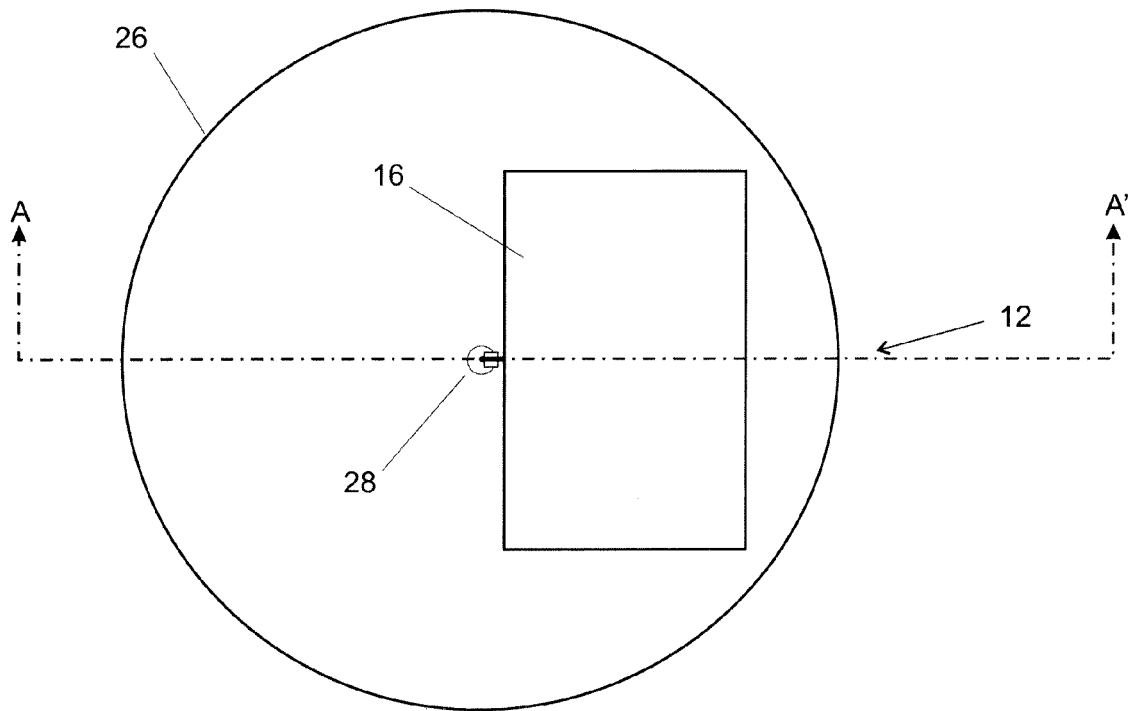


Figure 2

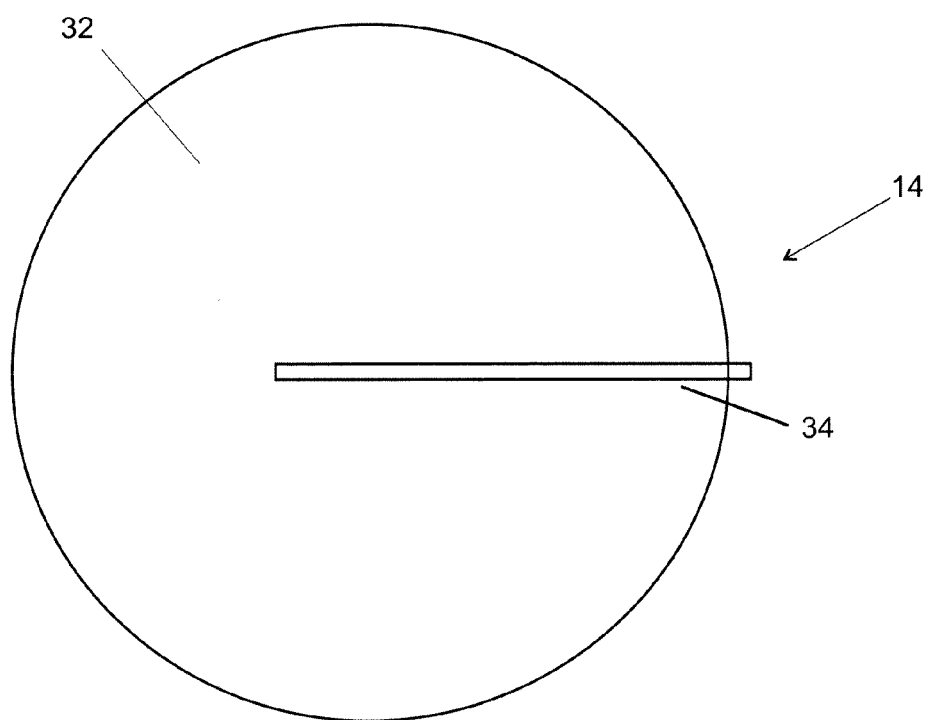


Figure 3

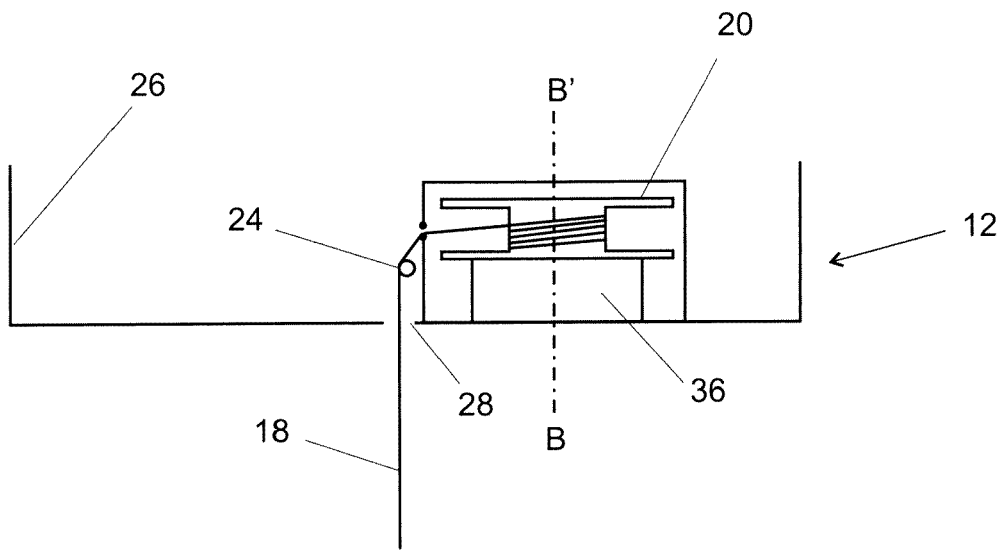


Figure 4

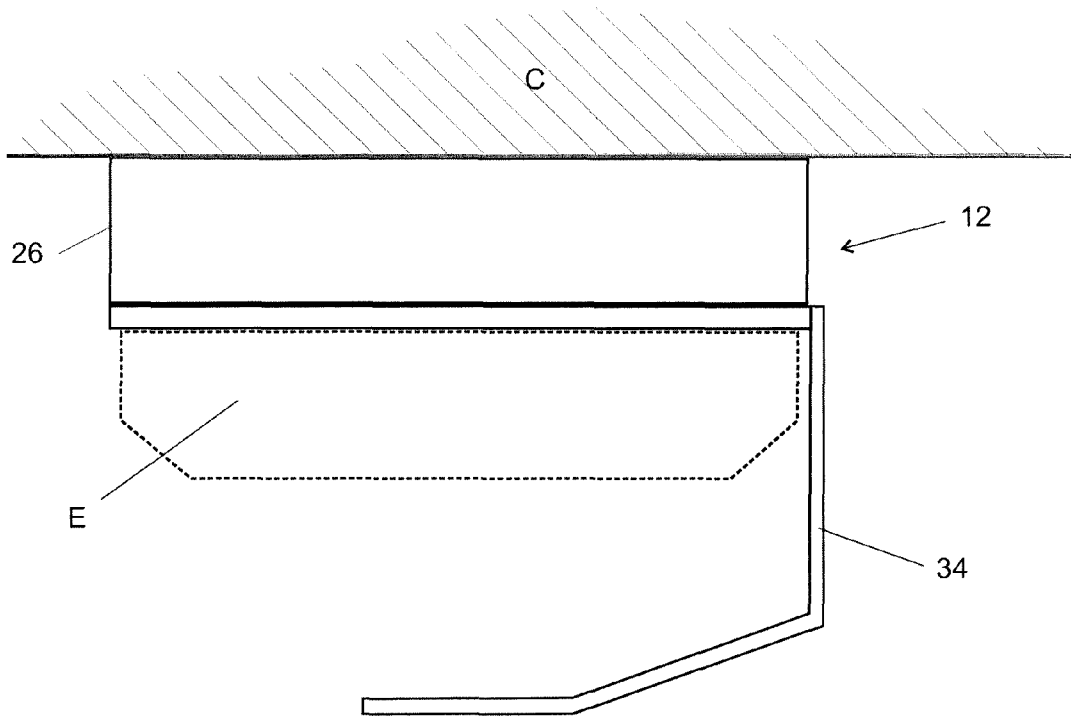


Figure 5

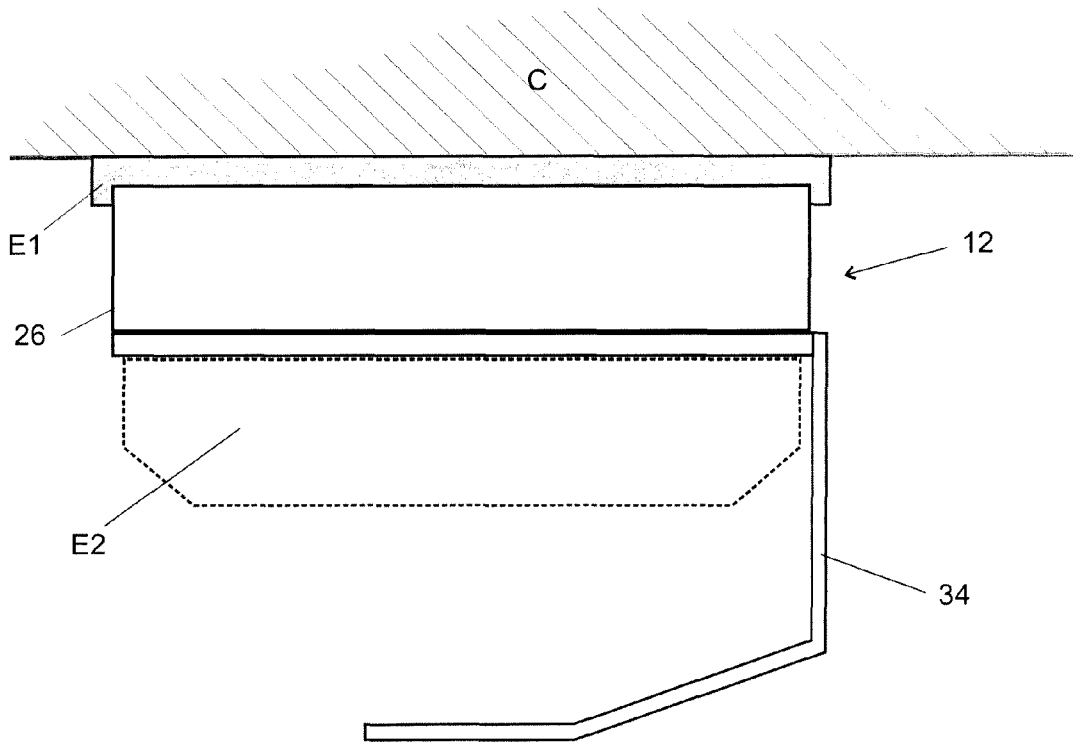


Figure 6

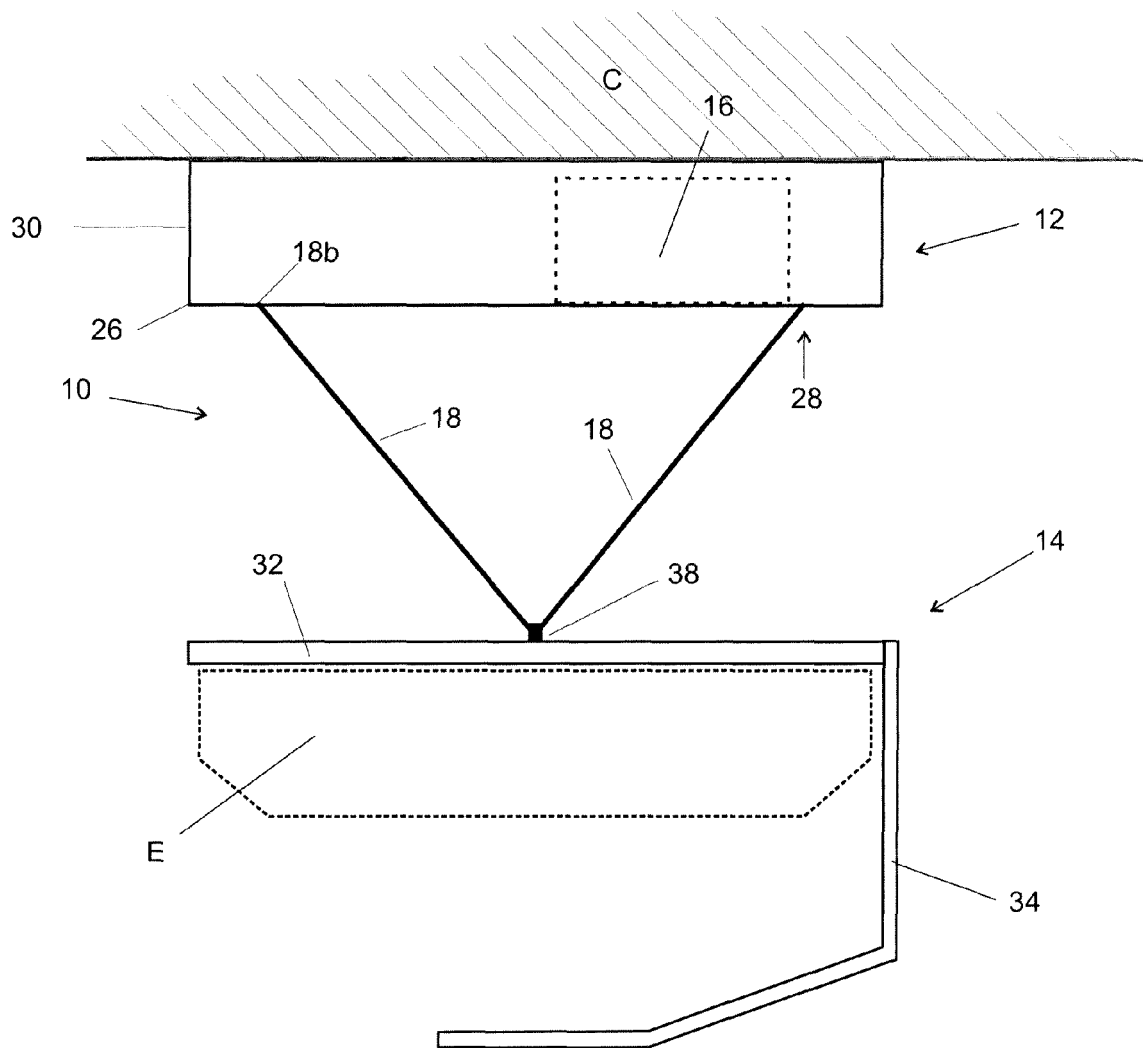


Figure 7



EUROPEAN SEARCH REPORT

Application Number
EP 14 25 0095

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	WO 2009/108991 A1 (CASCADE PRODUCTION PTY LTD [AU]; POOL JASON BRADLEY [AU]) 11 September 2009 (2009-09-11) * page 1, lines 5-18 * * page 1, line 20 - page 2, line 21 * * page 3, lines 3-6,25-33 * * page 4, lines 22-36; figures 1,3-5 * * page 6, line 25 - page 8, line 10 * * page 9, line 8 - page 11, line 3 * -----	1-7	INV. G08B17/10 B66D3/12 F21V21/38 G08B29/14 G08B29/18
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A	GB 2 420 899 A (FROST-GASKIN PETER [GB]) 7 June 2006 (2006-06-07) * page 1, lines 3, 15-29; figures 1-3 * * page 2, lines 1-33 * * page 3, lines 16-194 * * page 4, lines 20-23 * * page 5, line 1 - page 6, line 6 * * page 6, line 31 - page 7, line 2 * * page 7, line 25 - page 10, line 8 * -----	1-7	
			TECHNICAL FIELDS SEARCHED (IPC)
			F21V B66D G08B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		27 October 2014	Fagundes-Peters, D
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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