(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 822 732 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
25.02.2004 Bulletin 2004/09

(51) Int Cl.[7]: **H04R 1/28**, H04R 1/02

(21) Application number: **97305466.1**

(22) Date of filing: **22.07.1997**

(54) **Loud Speaker**

Lautsprecher

Haut-parleur

(84) Designated Contracting States:
BE DE ES FR GB IT NL

(30) Priority: **23.07.1996 GB 9615455**

(43) Date of publication of application:
04.02.1998 Bulletin 1998/06

(73) Proprietor: **MEDC Limited**
Pinxton, Nottingham NG16 6JF (GB)

(72) Inventor: **Oates, Philip, Manufacturing Electrical**
Nottingham, NG16 6JF (GB)

(74) Representative: **Swindell & Pearson**
48 Friar Gate
Derby DE1 1GY (GB)

(56) References cited:
EP-A- 0 555 951
DE-A- 2 930 069
DE-A- 3 312 318
DE-A- 3 347 158

Remarks:

The file contains technical information submitted after the application was filed and not included in this specification

EP 0 822 732 B1

Printed by Jouve, 75001 PARIS (FR)

Description

[0001] This invention relates to loud speakers. More particularly, but not exclusively, this invention relates to loud speakers for use in flammable atmospheres.

[0002] Loud speakers are used in dangerous areas, for example mine workings, offshore installations, petrochemical plants, in order to warn people of hazardous situations. The disadvantage of such speakers is that they can malfunction because of corrosion.

[0003] Loud speakers for use in flammable atmospheres must contain an internal explosion and not transfer it to the surrounding atmosphere. Strength is thus important.

[0004] A Speaker according to the preamble of claim 1 is for instance known from document EP-A-0 555 951.

[0005] According to the invention, there is provided a loud speaker comprising a housing, the housing being made of a sound dispersion means, and a main section extending rearwardly from the sound dispersion means, the sound disperson means being detachable from the main section, the loud speaker further including a sound emitting means in the housing, and a driver in the housing to drive the sound emitting means, characterised in that the housing is formed of a glass reinforced polyester and in that a flame path is defined between the main section and the sound dispersion means.

[0006] Preferably the sound dispersion means comprise a flare and in another embodiment, comprises a main flare and a secondary flare defining a re-entrant pathway.

[0007] The advantage of the use of a glass reinforced polyester plastics material is that it is highly resistant to corrosion, thereby providing the loud speaker with an exceedingly long lifetime. Also, the above design of loud speaker is capable of containing an explosion without transferring it to the surrounding atmosphere.

[0008] The housing may further include a removable cover member for the main section. Preferably, the sound dispersion means is attached by suitable attaching means, for example treads or bolts, to the main section. The sound dispersion means may be provided with screw threads to enable it to be screwed into the main section or vice versa.

[0009] The cover member may include a projecting portion, and the rear end region of the main section may define an aperture to receive said projecting portion. The cover member may further include a flange to engage the main section. Securing means may be provided to secure the cover member to the main section. The securing means may be in the form of screws adapted to extend through said flange. The main section is preferably provided with correspondingly threaded bores into which the screws can be screwed.

[0010] The projecting portion may taper inwardly from the flange member and the main section may be correspondingly tapered about said aperture. This has the advantage that the joint between the main section and the projecting portion provides a flame path in the event of an explosion.

[0011] An embodiment of the invention will now be described by way of example only with reference to the accompanying drawings, in which:-

Fig. 1 is an exploded side view of a loud speaker;
Fig. 2 is a rear view of an assembled loud speaker as shown in Fig. 1; and
Fig. 3 is a top plan view of the loud speaker shown in Fig. 2.

[0012] Referring to the drawings, there is shown a loud speaker 10 which comprises a housing 12, a sound emitting means 14, which may be formed from a sintered metal, arranged in the housing, and a driver 16 also arranged in the housing, to drive the sound emitting means 14. The sound emitting means 14 provides a flame proof barrier between the outside atmosphere and the interior of the loud speaker.

[0013] The housing comprises sound dispersion means 18 which is in the form of a flare and is outwardly tapered, as shown.

[0014] In one embodiment of the invention (not shown), the sound dispersion means comprises a main flare and a secondary flare (not shown) within the main flare defining a re-entrant pathway therewith.

[0015] The housing 12 further includes a main section 20 in which the electrical components of the loud speaker are housed. Electrical components may comprise standard electrical components known in the art. The main section 20 extends rearwardly from the sound dispersion means 18. The sound dispersion means 18 comprises an insertion portion 19 which is a screw fit into the main section 20. The joint between the sound dispersion means 18 and the main section 20 provides a flame path in the event of an explosion.

[0016] The rear end 28 of the main section 20 of the housing 12, i.e. the left-hand end as shown in Fig. 1, is covered by a cover member 22 comprising a flange member 24 and a projecting portion 26. The projecting portion 26 is adapted to be received in a corresponding aperture (not shown) defined at the rear end 28 of the main section 20. The projecting portion 26 is inwardly tapered as at 30, and the inner side walls of the main section 20 are correspondingly tapered. A plurality of screws 32 are adapted to extend through the flange member 20 to be received in correspondingly threaded bores (not shown); in the side wall of the main section 20.

[0017] The main section 20 defines a cable entry hole 21 to receive a cable (not shown) therethrough to supply power to the loud speaker. A plug 21A is provided which can be screwed on to the hole 21 to hold the cable in place, the cable passing through the plug 21A.

[0018] A mounting bracket 34 is pivotally mounted on the driver 16 by connecting members which are adapted to be received in recesses 36 at either side of the main

section 20. A screw 38 provided at each side of the bracket 34 can be released to allow the bracket 34 to be pivoted to a desired position. In this way, the orientation of the speaker 10 can be adjusted.

[0019] The main section 20 of a housing 12, the sound dispersion means 18, and the cover member 22 are formed of a glass reinforced polyester material. Also, the handle 34 may be formed of such a material. This has the advantage that the apparatus can be, without fear of corrosion, used in areas where there are chemicals which would usually be corrosive to loud speakers formed of metallic material. The loud speaker 10 also has the advantage that it is substantially flame proof and explosion proof.

[0020] Various modifications can be made without departing from the scope of the invention for example the cover member 22 can be threadably mounted to the main section 20. The bracket 23 can be mounted directly to the main section 20. The cable entry arrangement may take a modified form.

Claims

1. A loud speaker (10) comprising a housing (12) the housing (12) being made of a sound dispersion means (18), and a main section (20) extending rearwardly from the sound dispersion means, the sound dispersion means (18) being detachable from the main section (20), the loud speaker further including a sound emitting means (14) in the housing (12) and a driver (16) in the housing (12) to drive the sound emitting means (14) **characterised in that** the housing (18, 20) is formed of a glass reinforced polyester and **in that** a flame path is defined between the main section (20) and the sound dispersion means (18).

2. A loud speaker (10) according to claim 1, **characterised by** a removable cover member (22) for the main section (20).

3. A loud speaker (10) according to claim (2) **characterised in that** the sound dispersion means (18) is provided with screw threads (19) to enable it to be screwed into the main section (20) or vice versa.

4. A loud speaker (10) according to claim 2 or 3, **characterised in that** the cover member (22) includes a projecting portion (26), and the rear end region (28) of the main section (20) defines an aperture to receive said projecting portion (26) and **in that** the cover member (22) further includes a flange (24) to engage the main section (20).

5. A loud speaker (10) according to claim 4, **characterised in that** a securing means (32) is provided to secure the cover member (22) to the main section (20).

6. A loud speaker (10) according to claim 5, **characterised in that** the securing means is in the form of screws (32) adapted to extend through said flange (24), the main section (20) being provided with correspondingly threaded bores into which the screws (32) can be screwed.

7. A loud speaker (10) according to claim 6, **characterised in that** the projecting portion (26) tapers inwardly from the flange member (24) and the main section (20) is correspondingly tapered about said aperture.

Patentansprüche

1. Lautsprecher (10) mit einem Gehäuse (12), wobei das Gehäuse (12) aus einem Schall-Dispersionsmittel (18) und einem Hauptabschnitt (20) besteht, der sich von dem Schall-Dispersionsmittel nach hinten erstreckt, wobei das Schall-Dispersionsmittel (18) von dem Hauptabschnitt (20) abnehmbar ist und wobei der Lautsprecher ausserdem ein Schall-Aussendungsmittel (14) in dem Gehäuse (12) und einen Treiber (16) in dem Gehäuse (12) enthält, um das Schall-Aussendungsmittel (14) anzusteuern bzw. zu treiben, **dadurch gekennzeichnet, dass** das Gehäuse (18, 20) aus einem glasverstärkten Polyester gebildet ist und dass ein Flammenweg zwischen dem Hauptabschnitt (20) und dem Schall-Dispersionsmittel (18) festgelegt ist.

2. Lautsprecher (10) nach Anspruch 1, **gekennzeichnet durch** ein entfernbares Abdeckungsglied (22) für den Hauptabschnitt (20).

3. Lautsprecher (10) nach Anspruch 2, **dadurch gekennzeichnet, dass** das Schall-Dispersionsmittel (18) mit Schraubengewinden (19) ausgestattet ist, damit es in den Hauptabschnitt (20) geschraubt werden kann oder umgekehrt.

4. Lautsprecher (10) nach Anspruch 2 oder 3, **dadurch gekennzeichnet, dass** das Abdeckungsglied (22) einen hervorstehenden Abschnitt (26) enthält und der hintere Endbereich (28) des Hauptabschnitts (20) eine Öffnung zur Aufnahme des hervorstehenden Abschnitts (26) bestimmt, und dass das Abdeckungsglied (22) ausserdem einen Flansch (24) für den Eingriff mit dem Hauptabschnitt (20) enthält.

5. Lautsprecher (10) nach Anspruch 4, **dadurch gekennzeichnet, dass** ein Befestigungsmittel (32) zum Befestigen des Abdeckungsglieds (22) an dem Hauptabschnitt (20) vorgesehen ist.

6. Lautsprecher (10) nach Anspruch 5, **dadurch gekennzeichnet, dass** das Befestigungsmittel in Form von Schrauben (32) vorliegt, die dazu bestimmt sind, sich durch den Flansch (24) zu erstrekken, wobei der Hauptabschnitt (20) mit entsprechenden Gewindebohrungen ausgestattet ist, in welche die Schrauben (32) geschraubt werden können.

7. Lautsprecher (10) nach Anspruch 6, **dadurch gekennzeichnet, dass** der hervorstehende Abschnitt (26) sich von dem Flanschglied (24) aus nach innen hin verjüngt und dass der Hauptabschnitt (20) um die Öffnung herum entsprechend verjüngt ist.

Revendications

1. Haut-parleur (10) comprenant un boîtier (12), le boîtier (12) étant constitué d'un moyen (18) de diffusion du son et d'une section principale (20) s'étendant à l'arrière du moyen de diffusion du son, le moyen diffuseur de son (18) étant détachable de la section principale (20), le haut-parleur comprenant en outre des moyens (14) d'émission de son logés dans le boîtier (12) et un élément moteur (16) logé dans le boîtier (12) en vue d'entraîner les moyens (14) d'émission du son,
caractérisé en ce que le boîtier (18, 20) est fabriqué en polyester armé de verre et **en ce qu'**un chemin de flamme est défini entre la section principale (20) et le moyen (18) de diffusion du son.

2. Haut-parleur (10) selon la revendication 1, **caractérisé par** un élément de couvercle démontable (22) pour la section principale (20).

3. Haut-parleur (10) selon la revendication 2, **caractérisé en ce que** le moyen (18) de diffusion du son est pourvu d'un filetage (19) permettant de le visser dans la section principale (20), ou vice versa.

4. Haut-parleur (10) selon la revendication 2 ou 3, **caractérisé en ce que** l'élément de couvercle (22) comporte une partie saillante (26), et que la zone terminale arrière (28) de la section principale (20) définit une ouverture destinée à recevoir la partie saillante (26), et **en ce que** l'élément de couvercle (22) comprend en outre un rebord (24) destiné à entrer en engagement avec la section principale (20).

5. Haut-parleur (10) selon la revendication 4, **caractérisé en ce qu'**un moyen de fixation (32) est prévu pour fixer l'élément de couvercle (22) à la section principale (20).

6. Haut-parleur (10) selon la revendication 5, **caractérisé en ce que** les moyens de fixation se présentent sous forme de vis (32) conçues pour s'étendre à travers ledit rebord (24), la section principale (20) étant pourvue de trous taraudés correspondants, dans lesquels les vis (32) peuvent être vissées.

7. Haut-parleur (10) selon la revendication 6, **caractérisé en ce que** la partie saillante (26) se resserre en cône vers l'intérieur, depuis l'élément de rebord (24), et que la section principale (20) forme un cône correspondant autour de ladite ouverture.

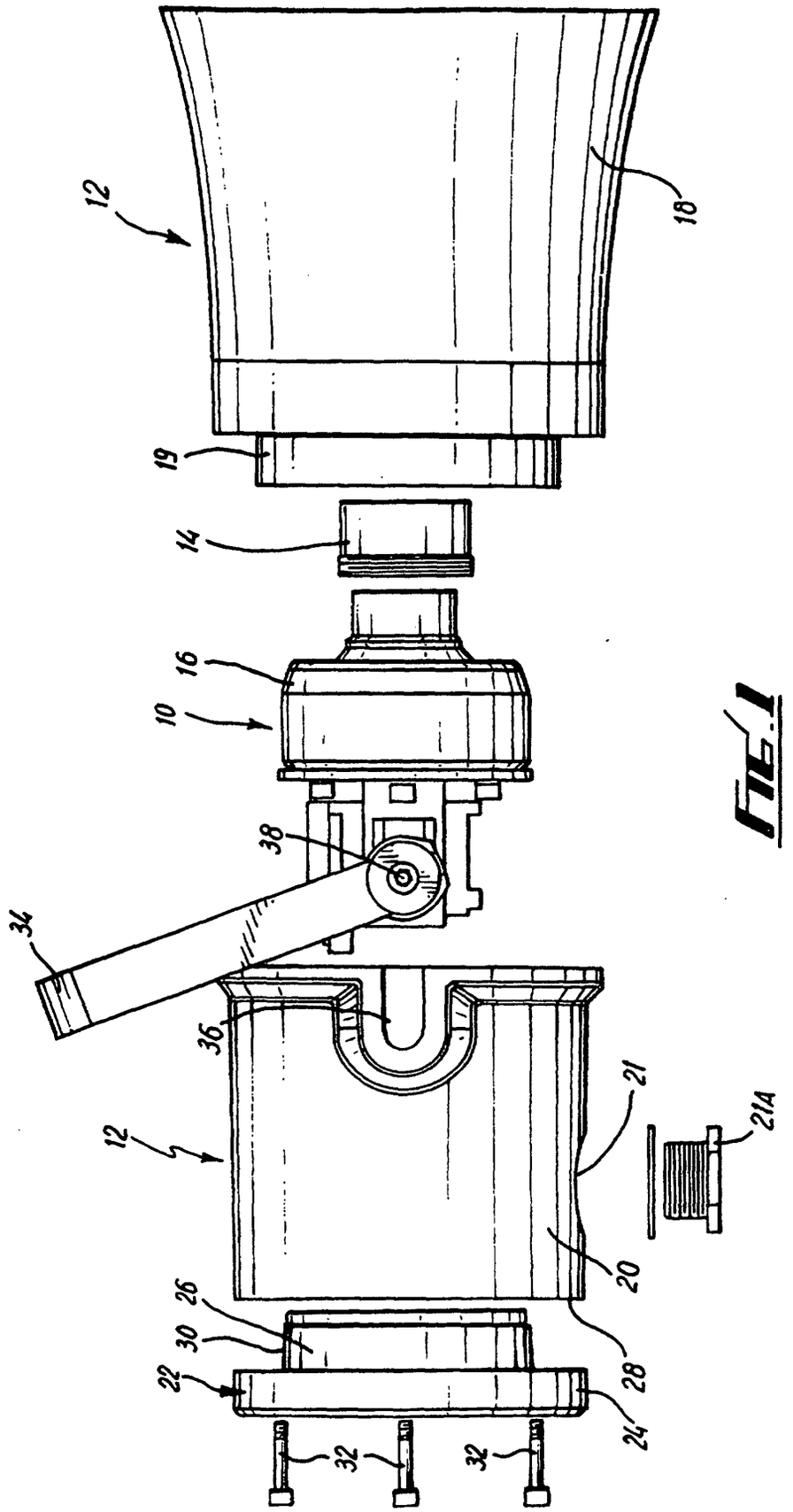
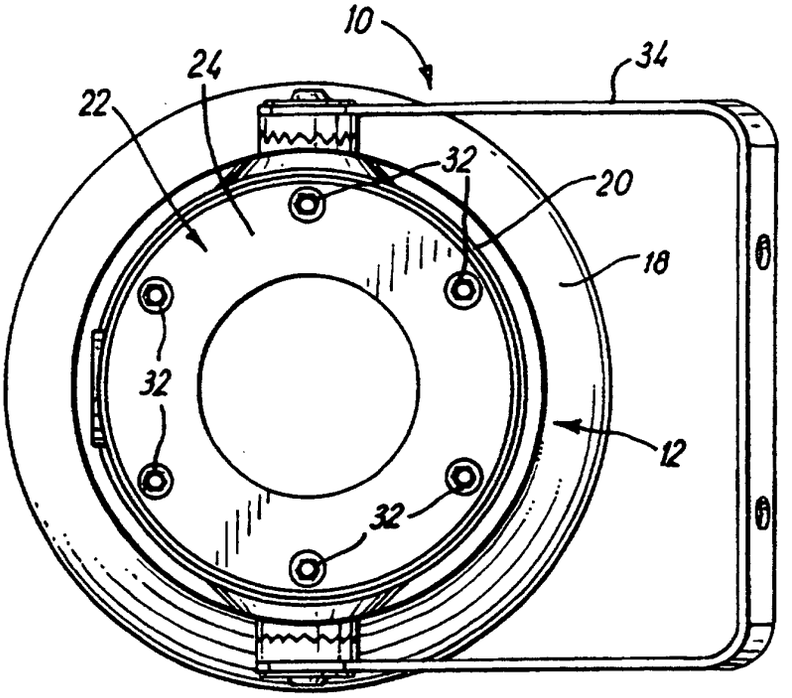
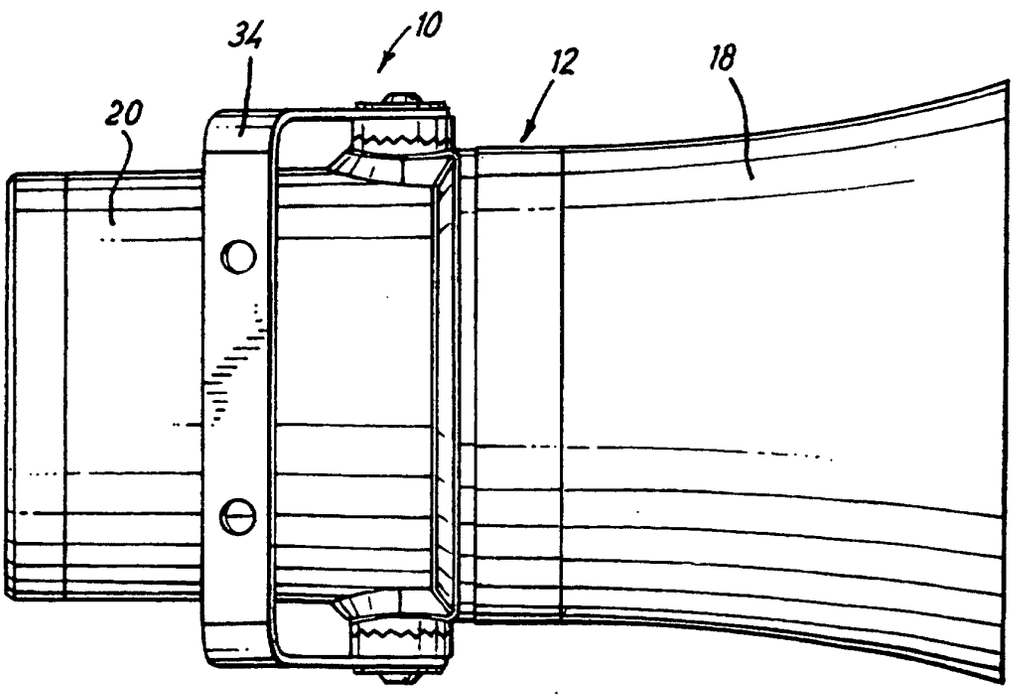


FIG.1



ФИГ.2



ФИГ.3