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(54) DEVICE FOR THE COLLECTION OF DIRT IN A SUCTION APPARATUS

VORRICHTUNG ZUR SAMMLUNG VON SCHMUTZ IN EINER SAUGVORRICHTUNG

DISPOSITIF POUR LA COLLECTE DE SALETE DANS UN APPAREIL D'ASPIRATION

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Description

FIELD OF THE INVENTION

[0001] The present invention concerns a device for the collection of dirt in a suction apparatus, for example a vacuum cleaner, an electric brush or similar apparatuses.

[0002] In particular, the device is used to close, automatically, the sack for collecting dirt sucked in when it has to be replaced. DE 3919256 discloses the features of the preamble of claim 1.

BACKGROUND OF THE INVENTION

[0003] A device is known, for closing a sack for the collection of dirt, used in a suction apparatus, comprising a closing element mounted sliding inside a plate attached to the sack and provided with a hole to allow the dirty air sucked in by the apparatus to enter into the sack. The closing element is able to close the hole of said plate when the sack has to be removed, so that the dust contained inside it does not come out.

[0004] One disadvantage of this known device is that, to close the hole of the sack, the closing element must be made to slide manually by the user of the apparatus. In performing this operation therefore, the user comes into contact with the dust and impurities inside the sack, with the consequent problems of a hygienic type deriving therefrom.

[0005] Another disadvantage of the known device is that releasing the sack from the compartment of the suction apparatus in which it is normally located and attached, is also done manually. This entails inconvenient operations by the user to replace the sack, with the risk that dust and impurities can come out of the sack.

[0006] Purpose of the present invention is to achieve a device for closing a sack for the collection of dirt, to be used in a suction apparatus, which allows the user of the apparatus not to come into contact with the dust and impurities in the sack, and also to replace the sack quickly and easily.

[0007] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0008] The present invention is set forth and characterized in the independent claim, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0009] In accordance with the above purpose, a device to close a sack for the collection of dirt used in a suction apparatus, for example a vacuum cleaner, an electric brush or similar apparatuses, comprises a container able to contain the sack. The latter comprises a plate provided with a first hole able to allow the passage of the air sucked

in by the apparatus inside the sack, and closing means mounted sliding on said plate, able to close said first hole.

[0010] According to a characteristic feature of the present invention, the container comprises drive means, able to be driven manually by the user, and to cooperate with the plate. Furthermore, the container comprises first attachment means, able to cooperate with said closing means.

[0011] Advantageously said drive means comprises a lid pivoted on a fixed part of the container.

[0012] Moreover, the lid advantageously comprises second attachment means, able to attach corresponding third attachment means, with which said plate is provided, to cooperate with the plate.

[0013] According to another characteristic feature of the present invention, said closing means comprises a shutter element, for example consisting of a sliding wall, provided with fourth attachment means, able to attach said first attachment means of the container. The shutter element is also provided with a second hole, of substantially the same size as the first hole and able to coincide with the latter, when the shutter element is in a determinate position inside said plate.

[0014] When the lid is closed, the plate and the shutter element are attached to the corresponding attachment means and the shutter element is in said determinate position, in which the second hole and the first hole coincide, allowing the dirty air sucked in to flow inside the sack.

[0015] To replace the sack it is necessary to lift the lid. Doing this, according to the present invention, the shutter element remains in any case attached to the first attachment means of the container, whereas the plate, attached to the second attachment means of the lid, is drawn by the latter upward together with the sack. As a consequence of the sliding of the plate with respect to the shutter element, the first hole of the plate is closed by the shutter element

[0016] In this way, we achieve an automatic closing of the sack, which prevents the user from coming into contact with the dust contained therein.

[0017] Furthermore, by rotating the lid by an ever-increasing angle and due to the effect of gravity, the plate and the shutter element are constrained by the corresponding attachment means. In this way, the sack falls automatically inside the container, ready to be collected by the user and thrown away, so that the replacement of the sack is quick and easy.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] These and other characteristics of the present invention will become apparent from the following description of a preferential form of embodiment, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a three-dimensional view of a device accord-

- ing to the present invention;
- fig. 2 is an exploded view of the device in fig. 1;
 - fig. 3 is a longitudinal section of the device in fig. 1 in a first operating condition;
 - fig. 4 is a longitudinal section of the device in fig. 1 in a second operating condition;
 - fig. 5 is a longitudinal section of the device in fig. 1 in a third operating condition.

DETAILED DESCRIPTION OF A PREFERENTIAL FORM OF EMBODIMENT

[0019] With reference to figs. 1 and 2, a device 10 for closing a sack 11 for the collection of dirt, according to the present invention, is able to be used in a suction apparatus of a known type, not shown in the drawings.

[0020] The device 10 comprises a container 12, made of plastic material, which is shaped so as to have a circular aperture 13 at one end. Below the circular aperture 13 and outside the container 12, a mobile pipe 14 is pivoted, able to be inserted inside the circular aperture 13. In the mobile pipe 14, furthermore, a sleeve is able to be inserted, of a known type and not shown in the drawings, to convey the dirty air, sucked in by the suction apparatus, inside the container 12, in particular inside the sack 11, as will be described in detail hereafter. The mobile pipe 14 also comprises at its upper part an attachment hole 15.

[0021] The sack 11 is able to be disposed inside the container 12 and comprises, at one end, a rigid plate 16, also, for example, made of plastic material. In this case, the rigid plate 16 is substantially square in shape and is provided, in its upper part, with a first attachment element, or upper attachment 17. The rigid plate 16 is provided at the center with a first circular hole 18, with a diameter substantially equal to that of the circular aperture 13 and into which the mobile pipe 14 is able to be inserted, in order to guarantee the sack 11 a greater stability inside the container 12 and to prevent loss of efficiency of the suction apparatus.

[0022] A closing wall 19, substantially rectangular in shape, is mounted sliding inside the rigid plate 16 so as to act as a shutter element 19. The closing wall 19 comprises at the lower part a second attachment element, or lower attachment 20, able to attach a corresponding attachment tooth 21 (fig. 3) made inside the container 12 below the circular aperture 13. The lower attachment 20 is also able to prevent the closing wall 19 from coming out of the rigid plate 16. The closing wall 19 is also provided in its lower half with a second circular hole 23 with a diameter substantially equal to that of the first circular hole 18.

[0023] In proximity with said attachment tooth 21, the container 12 is also provided with a guide plate 22, substantially rectangular in shape, disposed transverse to the container 12 and solid with a lateral wall thereof, able to guide the lower attachment 20 in correspondence with the first attachment tooth 21, to make the attachment.

[0024] A lid 24 is pivoted on a fixed part of the container

12, above and at the opposite end to that where there is the circular aperture 13.

[0025] The lid 24 is provided, inside and at the opposite end to that where it is pivoted to the container 12, with an attachment element 25, provided with three teeth 26, 27, 28 disposed so as to form a substantially cross-shaped profile.

[0026] The first tooth 26, disposed on the left in fig. 3 and facing toward the inside of the container 12, is able to attach the corresponding upper attachment 17 of the rigid plate 16, whereas the second tooth 27, disposed on the right in fig. 3 and facing toward the outside of the container 12, is able to be inserted into the attachment hole 15 of the mobile pipe 14. The third tooth 28, finally, is able to be inserted into a hollow 29 (fig. 4) made in the container 12 in correspondence with the upper part of the circular aperture 13.

[0027] The device 10 according to the present invention functions as follows.

[0028] In a first operating condition, shown in fig. 3, the container 12, containing the sack 11, is closed by the lid 24. The sack 11 is attached to the container 12 and to the lid 24 by means of the lower attachment 20 of the closing wall 19 and the upper attachment 17 of the rigid plate 16, attached respectively to the attachment tooth 21 and the first tooth 26 of the attachment element 25.

[0029] In said first operating condition, the closing wall 19 is in a position such that its second circular hole 23 and the first circular hole 18 of the rigid plate 16 coincide. In this way the mobile pipe 14, attached to the lid 24 by means of the second tooth 26 of the attachment element 25 which is inserted in the attachment hole 15, finds itself inside the sack 11. Therefore, through the sleeve, not shown in the drawings, inserted in the mobile pipe 14, the dirty air sucked in by the suction apparatus flows inside the sack 11.

[0030] When it is necessary to replace the sack, the user of the suction apparatus extracts the mobile pipe 14 from the sack 11 and from the container 12, making it rotate on the pins by means of which it is pivoted to the container 12 (fig. 4). Subsequently, the latter is opened by lifting the lid 24 and making it rotate. The closing wall 19 remains attached by means of the lower attachment 20 to the attachment tooth 21, whereas the rigid plate 16, attached to the first tooth 26 of the attachment element 25 of the lid 24, is drawn by the latter upward, together with the sack 11. In this way, as a consequence of the sliding of the rigid plate 16 with respect to the closing wall 19, the first hole 18 of the rigid plate 16 is closed by that part of the closing wall 19 where there is not the second hole 23, in practice automatically closing the sack 11.

[0031] Subsequently, by rotating the lid 24 (fig. 5) by an ever-increasing angle and due to the effect of gravity, the rigid plate 16 and the closing wall 19 are unconstrained by the corresponding attachments, automatically making the closed sack 11 fall inside the container 12, ready to be picked up by the user and thrown away.

[0032] It is clear that modifications and/or additions of parts may be made to the device for closing a sack for the collection of dirt as described heretofore, without departing from the field and scope of the present invention.

[0033] It is also clear that, although the present invention has been described with reference to some specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of device for closing a sack for the collection of dirt, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

Claims

1. Device for the collection of dirt, used in a suction apparatus, comprising a container (12) shaped so as to have a circular aperture (13) at one end and able to contain a sack (11), the sack (11) being provided with a plate (16) having a first hole (18) for allowing the passage inside said sack (11) of the air sucked in by said apparatus, and a closing wall (19) mounted sliding on said plate (16) and provided in its lower half with a second hole (23) aligned, during the use of the suction apparatus, with the first hole (18), the size of the second hole (23) being substantially equal to that of the first hole (18), the device further comprising a lid (24) pivoted on a fixed part of the container (12), **characterized in that** in the closed position of the lid (24) on the container (12), the plate (16) is attached to the lid (24) by means of a first attachment element, or upper element (17), which is able to attach to a first tooth (26) of an attachment element (25) provided on the lid (26), facing toward the inside of the container (12), and the closing wall (19) is attached to the container (12) by means of a second attachment element, or lower element (20) which is able to attach a corresponding attachment tooth (21) made inside the container (12) below said circular aperture (13), wherein, in a first open position of the lid (24) with respect to said container (12), said plate (16) is raised with respect the closing wall (19) thus misaligning the respective holes (18, 23) so as to automatically close the sack (11), the closing wall (19) remaining attached by means of the lower attachment (20) to the attachment tooth (21), whereas the rigid plate (16), attached to the first tooth (26), is drawn by the lid (24) upward together with the sack (11), and wherein, in a second open position of the lid (24) with respect to the container (12), having a greater angle than said first open position, the closing wall (19) is released from the container (12) thus making the closed sack (11) fall inside the container (12).
2. Device as in claim 1, **characterized in that** it also comprises a pipe (14) pivoted to one end of said container (12) and able to be inserted into said first

hole (18) of said plate (16).

3. Device as in claim 2, **characterized in that** said pipe (14) comprises an attachment hole (15) into which a corresponding attachment means (27) of said lid (24) is able to be inserted.
4. Device as in claim 1, **characterized in that** said container (12) comprises inside it a guide element (22) able to guide said closing wall (19) so as to make said second attachment means (20) cooperate with said first attachment tooth means (21).

15 Patentansprüche

1. Vorrichtung zum Sammeln von Schmutz, verwendet in einem Saugapparat, beinhaltend einen Behälter (12), der dazu ausgebildet ist, eine kreisförmige Öffnung (13) an einem Ende zu haben und der dazu eingerichtet ist, einen Sack (11) aufzunehmen, wobei der Sack (11) mit einer Platte (16) versehen ist, die ein erstes Loch (18) aufweist, das den Eingang der vom Apparat angesaugten Luft in das Innere des besagten Sacks (11) erlaubt, und eine Verschlusswand (19) die verschieblich an besagter Platte (16) angebracht ist und die in ihrer unteren Hälfte mit einem zweiten Loch (23) versehen ist, das während des Gebrauchs des Saugapparates mit dem ersten Loch (18) ausgerichtet, wobei die Größe des zweiten Lochs (23) mit der des ersten Lochs (18) im Wesentlichen gleich ist, wobei die Vorrichtung weiter einen Deckel (24) beinhaltet, der um einen festen Teil des Behälters (12) verschwenkbar ist, **dadurch gekennzeichnet, dass** in der geschlossenen Position des Deckels (24) am Behälter (12), die Platte (16) mittels eines ersten Befestigungselements oder oberen Elements (17), am Deckel (24) befestigt ist, wobei das obere Element (17) dazu eingerichtet ist einen ersten Zahn (26) eines Befestigungselement (25) festzulegen, das an dem Deckel (26) angeordnet ist und in Richtung zum Inneren des Behälters (12) ragt, und die Verschlusswand (19) am Behälter (12) mittels eines zweiten Befestigungselements oder unteren Elements (20) befestigt ist, das einen entsprechenden Befestigungszahn (21), der im Behälter (12) unterhalb der Kreisöffnung (13) angeordnet ist, festlegt wobei, in einer ersten Position des Deckels (24) in Bezug auf den besagten Behälter (12), die besagte Platte (16) in Bezug auf die Verschlusswand (19) angehoben ist, so dass die jeweiligen Löcher (18, 23) nichtfluchtend ausgerichtet sind, um den Sack (11) automatisch zu verschließen, wobei die Verschlusswand (19) über das untere Befestigungselement (20) am Befestigungszahn (21) befestigt bleibt, während die am ersten Zahn (26) befestigte steife Platte (16) durch den Deckel (24) zusammen mit dem Sack (11) aufwärts gezogen wird, und wobei

in einer zweiten offenen Position des Deckels (24) in Bezug auf den Behälter (12), der einen größeren Winkel hat als in der ersten Position, automatisch sofort zu schließen angehoben und, wird die Verschlusswand (19) vom Behälter (12) freigegeben

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** sie auch ein Rohr (14) beinhaltet, das zu einem Ende des besagtem Behälters (12) geschwenkt wird und fähig ist, in besagtes erstes Loch (18) besagter Platte (16) eingefügt zu werden.
3. Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** das besagte Rohr (14) eine Aufnahmebohrung (15) beinhaltet, in die ein entsprechendes Befestigungsmittel (27) des besagten Deckels (24) eingeführt werden kann.
4. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der besagte Behälter (12) in sich ein Führungselement (22) beinhaltet, das eingerichtet ist die Verschlusswand (19) zu führen, um die zweiten Befestigungsmittel (20), mit den ersten Befestigungsmitteln (21) zusammenwirken zu lassen.

Revendications

1. Dispositif pour la collecte de saleté, utilisé dans un appareil d'aspiration, comprenant un récipient (12) conformé de manière à avoir une ouverture circulaire (13) à une extrémité et apte à contenir un sac (11), le sac (11) étant pourvu d'une plaque (16) ayant un premier trou (18) pour permettre le passage à l'intérieur dudit sac (11) de l'air qui y est aspiré par ledit appareil, et une paroi de fermeture (19) montée coulissante sur ladite plaque (16) et pourvue sur sa moitié inférieure d'un second trou (23) aligné, durant l'utilisation de l'appareil d'aspiration, avec le premier trou (18), la taille du second trou (23) étant sensiblement égale à celle du premier trou (18), le dispositif comprenant en outre un couvercle (24) pivotant sur une partie fixe du récipient (12), **caractérisé en ce que** dans la position fermée du couvercle (24) sur le récipient (12), la plaque (16) est fixée sur le couvercle (24) au moyen d'un premier élément de fixation, ou d'un élément supérieur (17), qui est apte à se fixer à une première dent (26) d'un élément de fixation (25) prévu sur le couvercle (26), tourné vers l'intérieur du récipient (12), et la paroi de fermeture (19) est fixée sur le récipient (12) au moyen d'un second élément de fixation, ou d'un élément inférieur (20) qui est apte à se fixer à une dent de fixation correspondante (21) réalisée à l'intérieur du récipient (12) sous ladite ouverture circulaire (13), dans lequel, dans une première position ouverte du cou-

vercle (24) par rapport audit récipient (12), ladite plaque (16) est élevée par rapport à la paroi de fermeture (19) rompant ainsi l'alignement des trous respectifs (18, 23) de façon à fermer automatiquement le sac (11), la paroi de fermeture (19) restant fixée au moyen de la fixation inférieure (20) à la dent de fixation (21), tandis que la plaque rigide (16), fixée à la première dent (26), est tirée par le couvercle (24) vers le haut avec le sac (11), et dans lequel, dans une seconde position ouverte du couvercle (24) par rapport au récipient (12), ayant un angle plus grand que ladite première position ouverte, la paroi de fermeture (19) est relâchée du récipient (12) faisant ainsi tomber le sac fermé (11) à l'intérieur du récipient (12).

2. Dispositif selon la revendication 1, **caractérisé en ce qu'il** comprend également un tube (14) pivotant à une extrémité dudit conteneur (12) et apte à être insérée dans ledit premier trou (18) de ladite plaque (16).
3. Dispositif selon la revendication 2, **caractérisé en ce que** ledit tube (14) comprend un trou de fixation (15) dans lequel un moyen de fixation correspondant (27) dudit couvercle (24) est apte à être inséré.
4. Dispositif selon la revendication 1, **caractérisé en ce que** ledit récipient (12) comprend en son sein un élément de guidage (22) apte à guider ladite paroi de fermeture (19) de façon à faire coopérer lesdits seconds moyens de fixation (20) avec lesdits premiers moyens dentés de fixation (21).

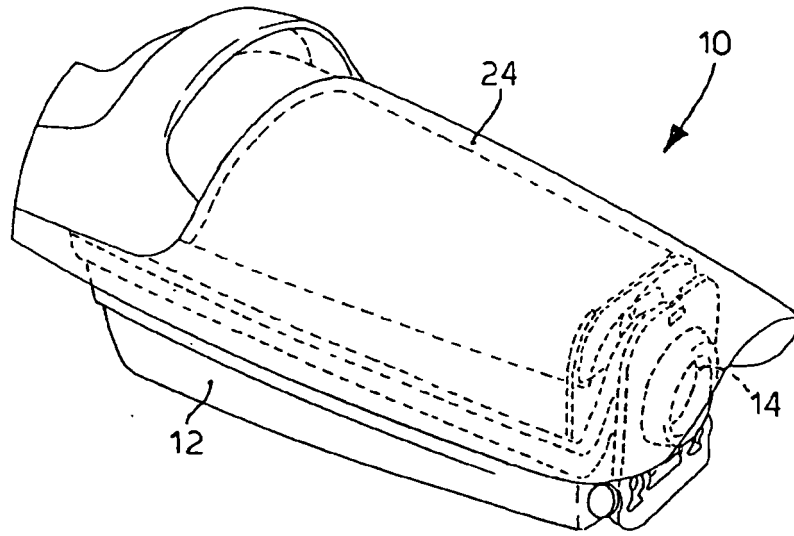


fig. 1

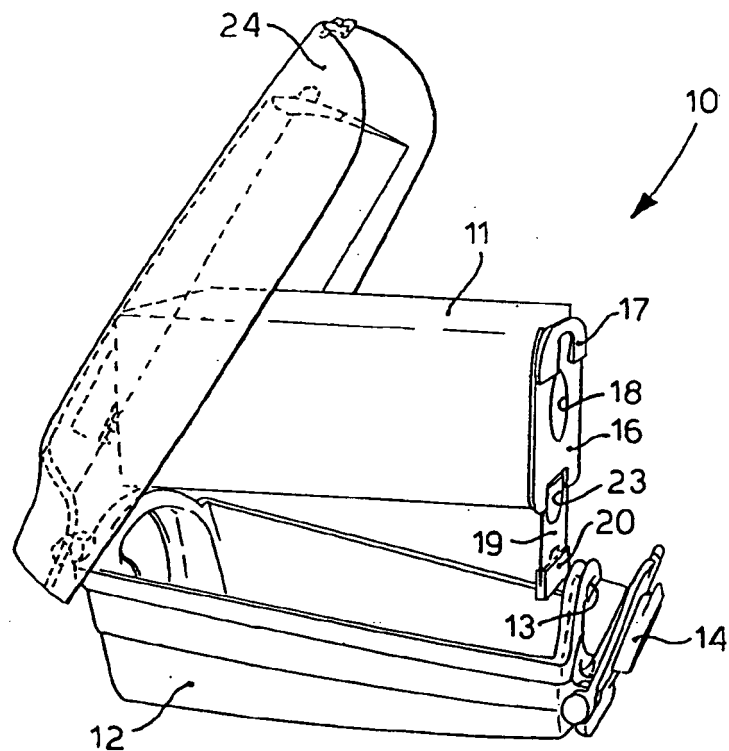
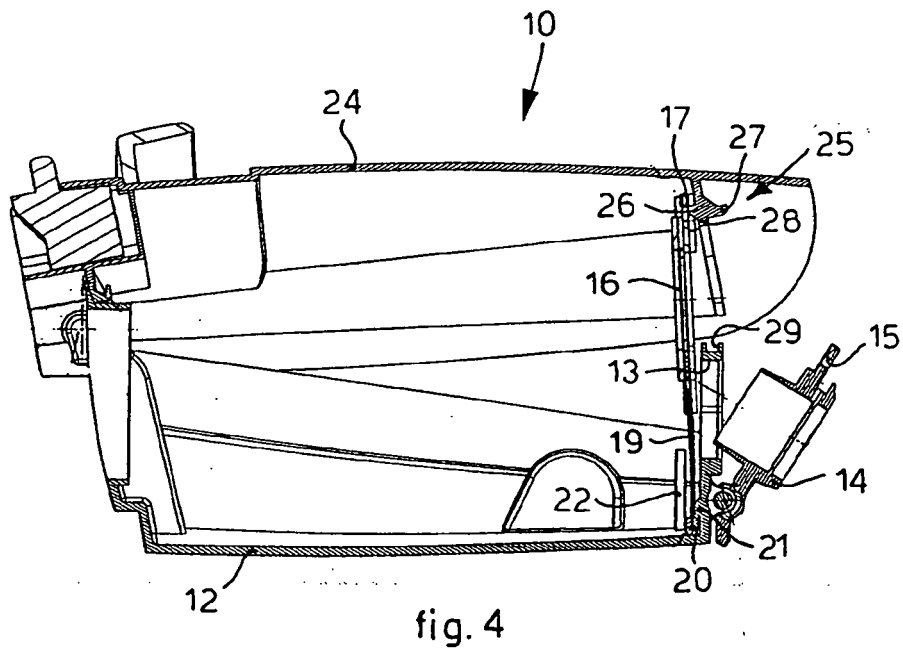
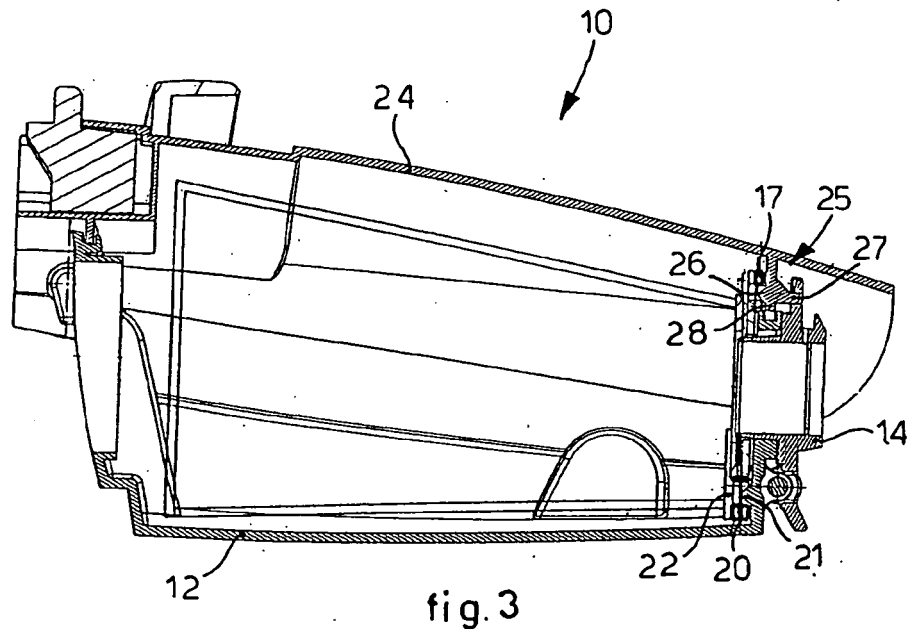


fig. 2



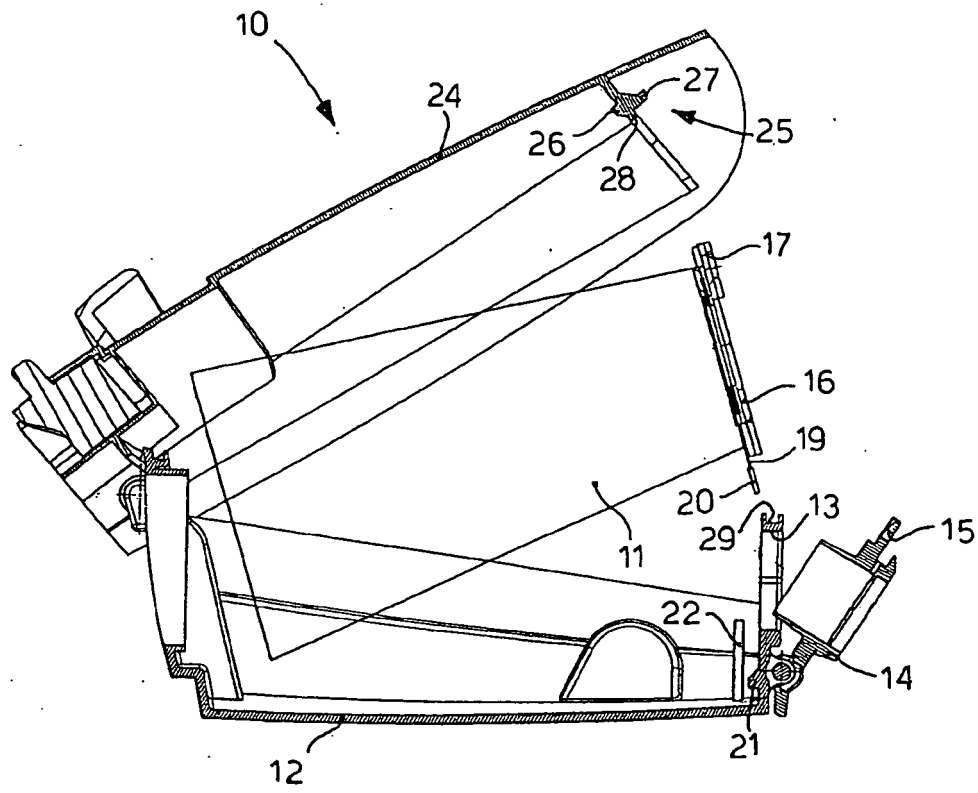


fig. 5

REFERENCES CITED IN THE DESCRIPTION

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