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(54) **IMPROVEMENTS TO ULTRACOMPACT AIR EXTRACTORS FOR BATHROOMS**

VERBESSERTE ULTRAKOMPAKTE LUFTABZÜGE FÜR BADEZIMMER

AMELIORATIONS APPORTEES AUX SYSTEMES D'EVACUATION ULTRACOMPACTS DE SALLES DE BAIN

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Description

[0001] The invention refers to an extractor fan used mainly at the bathrooms for the extraction of steams and humidities and as a consequence of it s final destination must comprise a series of specific elements which, on the one hand prevent the damages produced by such humidity and steams and on the other hand do not allow the air entering from the outside to the inside of the room or bathroom where such are installed when said extractor fans are in an idle situation.

[0002] Furthermore and as a consequence of the design of such extractor fan being made for bathrooms, it s another object of the present invention the reduction of certain common elements in the extractor fans, such as the connection s connector, the centralization of functions and general electric circuitry of the extractor fan.

[0003] EP0242342 refers to a fan which comprises an attachment unit for fastening to support means and provided with an opening corresponding to an air duct in said support means, a motor housing unit, means for engaging said attachment unit and said motor housing unit together, and a couple for electrical terminal means.

[0004] ES2026375 discloses a extractor fan of the centrifugal type comprising a housing, an inlet portion, an impeller driven by a motor and an outlet portion having a discharge mouth. The air flows through an opening formed in the outlet portion by being forced out to undergo a 90 degree change of direction inside the housing. Quick coupling means are also provided to readily engage a cover in the inlet portion.

[0005] The improvements deal basically in the systems for closing the extractor fan s tunnel, when same is in the idle position, which object is that of avoiding, as a consequence of the difference of temperatures between the outside and the interior, to give place to air draughts, as well as the protection of certain electric and electronic elements, also as well to the attachment system of the extractor fan to the vertical faces or any other support element which is used in said room where it is installed. The invention is defined by the features of claim 1.

[0006] The improved extractor fan incorporates as a system for shutting the tunnel a shutter to the exit of the air of the extractor fan installed in the interior of the room, which in grace to the material out of which it s manufactured and to the attachment system of same allows that in the working position lets a free passage to the air extracted whilst when the extractor fan remains idle said shutter fully stops the entry of air from the outside through the tunnel, avoiding in such a way that the installation of same have an effect on the conditioning of the room or bathroom itself where the extractor fan has been installed when it is not in use.

[0007] In a parallel way there have also been modified the anchoring systems of the extractor fan to the vertical face or walls since it incorporates retention means which may be activated from the inside of the extractor fan and which avoid any type of displacement or vibration of the proposed extractor fan, being added said retention means to the conventional screws with which the extractor fans that may be considered of the state of the art are provided in the corners of the extractor fan s support for binding same to said wall or vertical face.

[0008] Finally, the proposed extractor fan concentrates all the electric installation in a printed circuit board, and in order to avoid to same the undesired effects of the humidifies or steam it is protected with the corresponding lid, further achieving a centralization of all the functions of the extractor fan in said printed circuit board.

[0009] Further details and features of the present Patent of Invention application will be manifest at the description that follows in which, in a rather schematic way, reference is made to the figures which in this description represent the preferred details. These details are given as an example, with reference to a possible practical embodiment, but it s not limited to the details explained herewith; therefore this description must be considered from an illustrative point of view and with no restrictions whatsoever.

[0010] There follows a report of the several elements numbered in the drawings joined to the present description; (10) extractor fan, (11) front lid, (12) window, (13) flaps, (14) support, (14.1) discharge tube, (15) corners, (16) holes, (17) screw, (18) hooks, (19) motor, (20) propeller, (21) blades, (22) electronic circuit board, (23) protector, (24) sight, (25) diffusor, (26) passages, (27) directing paddles, (27.1) emerging zone, (27.2) depressed zone, (28) brackets, (29) shutter, (29.1) notches, (30) hinge, (31) connector, (32) screws, (33) wire, (34) channels, (35) pin, (36) fringe, (37) recess.

Figure 1 is an explosion perspective view of the essential elements and portions of the extractor fan (10).

Figure 2 is an elevation front view of the support (14) and of the elements installed on same.

Figure 3 is an elevation front view of the rear portion of the support (14).

Figure 4 es an upper plant view of the shutter (29).

[0011] In one of the preferred embodiments of what is the object of the present application and as can be seen in Figure 1, the extractor fan (10) is formed with a front lid (13) of a noticeably quadrangular shape in which central portion is provided a window (12), which in turn is provided with flaps (13) horizontal and parallel among themselves.

[0012] Said front lid (13) is attached with the help of the screw (17) on the support (14). The support (14) presents a body of a noticeably prismatic configuration, in which front face is incorporated as above described the front lid (13) whilst at the rear face extends as per a discharge tube (14.1)

[0013] In the interior of the tunnel (14.1) is fitted the

electric motor (19) duly attached to the central portion of the support by the suitable screws the shaft of the motor (19) is coupled to the propeller (20) of blades (21) and interior brackets (28) remaining same inside the tube (14.1), being situated over it s outside circular perimeter the diffussor (25), provided with the direction paddles (27), formed by the emerging zone (27.1)) and the depressed zone (27.2)), over wich is mounted the shutter (29) with the help of the hinge (30).

[0014] The proposed improvements bear in the first place in the system of attachment of the extractor fan (10) to the face, wall or the like on which is coupled, which is done with the help of the hooks (18), see Figure 1, and once fixed to the opening provided in the corresponding wall it is finished fixing the support (14) with the help of the corresponding screws positioned at the corners (15), see Figure 1.

[0015] The hooks (18), as can be seen in Figures 1, 2 and 3, show three different zones, a retention zone (18.1), a spring zone (18.2) an a hook zone (18.3). The hook (18) is attached to the support (14) by the spring zone (18.2) which, since it has a cylindrical interior is coupled to a cylindrical pin (35), in such a way that the hook zone (18.3) remains retained in the fringe (36) and lodged in the channels (34), whilst the retention zone rests on the recess (37) provided in the rear face of the support (14).

[0016] A further object of the present improvements remains in the front and centered position of all the connection electric and electronic elements in the front portion of the support (14), through the electronic circuit board (22), whose reduced dimensions allows it s setting in the outer portion of the support (14), see Figure 2, keeping it safe from the undesired actions of steams, liquids and condensations having foreseen that same is protected by means of the protector (23), see Figure 1, in which has been designed the availability of a sight (24) corresponding with the brackets (28) that is in the lower portion of the front lid (13), not causing therefore any hindrance said protector (23) design and the protection of the circuit in order that the control pilot light, not shown in the Figures, may be seen from the outside through the protector (23) and the front lid (13).

[0017] Furthermore, other of the improvements foreseen in the present invention consist in the design of a small connector (31) which centralizes the electric wires (33) which relate to the hooks (18) as well as the hooks (18) and the electronic circuit board (22), see Figure 1.

[0018] The extractor fan is also provided with means for covering the opening of the discharge tube (14.1) comprising a shutter (29) of a noticeably circular configuration provided at the diametral zone with the notches (29.1) which allow in the operating position of the extractor fan (10) and because of the pressure generated by the movement of the propeller (20) and the blades (21) that the shutter (29) bends at the notches (29.1) allowing the passage of the air extracted from the room or bathroom where the extractor fan (10) is fitted and not offering any kind of resistance to it, being provided it s construction with plastic materials or the like whose resistance to torque is minimal.

[0019] When the extractor fan (10) goes to the idle position, the own inertia of the material in which has been constructed the shutter (29) allows that same returns to its original position shutting the circular opening of the discharge tube (14.1) and preventing in this way that the temperatures difference between the outside and the interior of the room where the extractor fan has been installed to be the cause for the air, water, steams and other undesired elements to penetrate from the outside towards the interior.

[0020] A further object of the present invention is the working action of the hooks (18), which, when in the idle situation, occupy the above described position and represented in Figures 2 and 3, whilst in the working position and when the installer adjusts the discharge tube (14.1) to the opening provided at the wall, the hook (18.3) will be practically perpendicular to the plane of the support (14), pressing strongly in the counter-clockwise sense at an angle of aproximately 90° till snap fitting the retainer (18.1) into the fringe (36) in such a way that the retainer (18.1) exerts a retention strength on the side walls of the opening made for the assembly of the extractor fan (10).

[0021] Another further object of the present invention consists in the improvements introduced in the disposition of the blades (21) in the propeller (20) in which, in grace to the proposed improvements are placed asymetrically, see Figure 1, by which are avoided the noises and vibrations over the levels acceptable for the user, all that in combination with the design of the direction paddles (27) above described.

[0022] Enough described in what the present Patent of Invention consists, it s understood that in same may be introduced whatever detail modifications deemed convenient always provided that the variations introduced do not alter the essence of the Patent which is defined in the following Claims.

Claims

1. Extractor fan comprising a support (14) provided with an opening, said support (14) extending as a discharge tube (14.1), and means for covering the opening of the discharge tube (14.1), and a diffuser (25), **characterized in that** said means for covering the opening of the discharge tube (14.1) comprise a shutter (29) made of a flexible material, said shutter (29) comprising a sheet-like element extending perpendicular to the axis of said discharge tube (14.1) at the outlet opening thereof, said shutter (29) being able to be bent about a bending line extending through said opening, the shutter portions on both sides of said bending line being resiliently movable from a position closing said opening to a opened

position under the effect of the pressure of the air to be extracted.

2. Extractor fan according to claim 1, **characterized in that** said shutter (29) has a substantially circular configuration and **in that** it is attached at two diametrically opposed portions to said discharge tube (14.1), said bending line extending between said two portions.

3. Extractor fan according to any preceding claim, **characterized in that** said bending line of said shutter (29) is formed by a number of notches (29.1).

4. Extractor fan according to any preceding claim, **characterized in that** said shutter is arranged into said diffuser (25) by means of a hinge (30) extending between said attachment portions of the shutter (29).

5. Extractor fan according to any preceding claim, **characterized in that** is further comprises a front lid (11) having an opening (12) and provided at the rear face of said support (14) which extends as said discharge tube (14.1), a propeller (20) provided with blades (21), an electronic circuit board (22) provided at the lower portion of the support (14) in a central position thereof and being shielded by means of a protector (23) in which a pilot light (24) is provided fitted into said front lid (11), means for attaching the extractor fan (10) to a vertical face provided in said support (14) and flow rate adjusting means provided in said propeller (20).

6. Extractor fan according to claim 5, **characterized in that** said means for attaching the extractor fan (10) to a vertical face comprise hooks (18) secured by the upper portion thereof to cylindrical stumps (35) provided at the central portion of said support (14).

7. Extractor fan according to claim 5, **characterized in that** the blades (21) of the propeller (20) are arranged asymmetrically relative to the axis of rotation thereof.

8. Extractor fan according to claim 6, **characterized in that** said hooks (18) are formed of a U-shaped detent (18.1) extending as a cylindrical spring (18.2) which extends as a single 4-shaped hook (18.3).

9. Extractor fan according to claim 6, **characterized in that** said hooks (18) act, in the working position, by one of their ends (18.1), on the inner face of a bore formed at the wall where the extractor fan is to be mounted, and at the opposed end by a hook (18.3) clamped by a flange (36) provided in the support (14) and received into a channel (34).

Patentansprüche

1. Absauggebläse bestehend aus einem Halterahmen (14), der mit einer Öffnung versehen ist und in ein Abzugsrohr (14.1) mündet, sowie aus einem Mittel zur Abdeckung der Öffnung des Abzugsrohres (14.1) und einem Diffusor (25), **dadurch gekennzeichnet, dass** das Mittel zur Abdeckung der Öffnung des Abzugsrohres (14.1) aus einer Verschlussblende (29) besteht, die aus flexiblem Material gefertigt und als scheibenähnliches Element ausgebildet ist, das senkrecht zur Achse des Abzugsrohres (14.1) an dessen Ausströmöffnung verläuft, und dass die Verschlussblende (29) um eine Biegelinie gebogen werden kann, die durch genannte Öffnung verläuft, wobei die Teilstücke der Verschlussblende auf beiden Seiten der Biegelinie elastisch beweglich sind, sodass sie von einer Stellung, in der die Öffnung geschlossen ist, unter Einwirkung des Drucks der abzusaugenden Luft in eine geöffnete Stellung übergehen können.

2. Absauggebläse nach Anspruch 1, **dadurch gekennzeichnet, dass** die Verschlussblende (29) im Wesentlichen kreisförmig ausgebildet und dass sie an zwei gegenüberliegenden Teilstücken am Abzugsrohr (14.1) befestigt ist, wobei die Biegelinie zwischen den beiden Teilstücken verläuft.

3. Absauggebläse nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Biegelinie der Verschlussblende (29) aus einer Reihe von Aussparungen (29.1) gebildet ist.

4. Absauggebläse nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Verschlussblende mittels eines Gelenks (30), das zwischen den genannten Befestigungsteilstücken der Verschlussblende (29) verläuft, im Diffusor (25) untergebracht ist.

5. Absauggebläse nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** es darüber hinaus aus einer Frontabdeckung (11) besteht, die eine Öffnung (12) aufweist und an der Rückseite des Halterahmens (14), der in das Abzugsrohr (14.1) mündet, vorgesehen ist, sowie aus einer mit Flügeln (21) versehenen Luftschraube (20), einer elektronischen Leiterplatte (22), die im unteren Teil des Halterahmens (14) in mittiger Position vorgesehen ist und von einer Schutzvorrichtung (23) abgedeckt wird, in der eine Anzeigeleuchte (24) vorgesehen ist, die an der Frontabdeckung (11) befestigt ist, sowie aus einem Mittel zur Befestigung des Absauggebläses (10) an einer vertika-

len Fläche, die am Halterahmen (14) vorgesehen ist, und ein Mittel zur Regulierung der Durchflussleistung, welches in der Luftschraube (20) vorgesehen ist.

6. Absauggebläse nach Anspruch 5, **dadurch gekennzeichnet, dass** das Mittel zur Befestigung des Absauggebläses (10) an einer vertikalen Fläche aus Haken (18) besteht, die an ihrem oberen Teil an zylinderförmigen Stümpfen (35), die im mittleren Teil des Halterahmens (14) vorgesehen sind, befestigt sind.

7. Absauggebläse nach Anspruch 5, **dadurch gekennzeichnet, dass** die Flügel (21) der Luftschraube (20) asymmetrisch zu ihrer Rotationsachse angeordnet sind.

8. Absauggebläse nach Anspruch 6, **dadurch gekennzeichnet, dass** die Haken (18) als u-förmige Klinken (18.1) ausgebildet sind, die in eine zylinderförmige Feder (18.2) übergehen, welche wiederum in einen einzelnen 4-förmigen Haken (18.3) ausläuft.

9. Absauggebläse nach Anspruch 6, **dadurch gekennzeichnet, dass** die Haken (18) in der Arbeitsstellung durch eines ihrer Enden (18.1) auf die Innenfläche einer Bohrung wirken, die in der Wand, an der das Absauggebläse angebracht wird, vorgesehen ist, und am entgegengesetzten Ende durch einen Haken (18.3) wirken, der mit einem Flansch (36) festgeklemmt ist, der am Halterahmen (14) vorgesehen ist und in einer Auskehlung (34) aufgenommen wird.

Revendications

1. Ventilateur d'extraction composé d'un cadre (14) muni d'une ouverture, ce cadre (14) présentant une goulotte d'évacuation orientable (14.1), de dispositifs pour couvrir l'ouverture de la goulotte d'évacuation orientable (14.1), et d'un diffuseur (25). Il se **caractérise par le fait que** ces dispositifs pour couvrir l'ouverture de la goulotte d'évacuation orientable (14.1) comprennent un volet (29) réalisé en matériau flexible, ce volet (29) comprenant un élément en feuille allant perpendiculairement de l'axe de la goulotte d'évacuation orientable (14.1) au tuyau de sortie de celui-ci ; ce volet (29) peut être tourné selon une ligne de rotation se prolongeant à travers cette ouverture ; les parties du volet, sur les deux côtés de cette ligne de rotation, peuvent passer d'une position fermée à une position ouverte sous l'effet de la pression de l'air à extraire.

2. Ventilateur d'extraction conformément à la caractéristique 1, **caractérisé par le fait que** le volet (29) présente une configuration substantiellement circulaire et qu'il est fixé à deux parties diamétralement opposées de la goulotte d'évacuation orientable (14.1), la ligne de rotation se prolongeant entre les deux parties.

3. Ventilateur d'extraction conformément à la caractéristique précédente, **caractérisé par le fait que** la ligne de rotation du volet (29) est formée d'un certain nombre d'encoches (29.1).

4. Ventilateur d'extraction conformément à la caractéristique précédente, **caractérisé par le fait que** le volet est disposé dans le diffuseur (25) au moyen d'une charnière (30) se prolongeant entre les parties de fixation du volet (29).

5. Ventilateur d'extraction conformément à la caractéristique précédente, **caractérisé par le fait qu'**il comprend, de plus, un couvercle frontal (11) ayant une ouverture (12) et inséré à l'arrière du support (14) qui se prolonge par la goulotte d'évacuation orientable (14.1), ainsi qu'une hélice (20) munie de lames (21), un tableau de circuit électrique (22) inséré sur la partie inférieure du support (14) dans sa position centrale et protégé par un protecteur (23) sur lequel un voyant lumineux (24) est encastré dans le couvercle central (11), des dispositifs pour fixer l'extracteur à ventilation (10) sur un côté vertical de ce support (14) et un réglage du flux d'écoulement au moyen de l'hélice (20).

6. Ventilateur d'extraction conformément à la caractéristique 5, **caractérisé par le fait que** les dispositifs pour fixer l'extracteur à ventilation (10) sur la face verticale comprennent des crochets (18) accrochés, sur leur portion supérieure, à des moignons cylindriques (35) insérés sur la partie centrale du support (14).

7. Ventilateur d'extraction conformément à la caractéristique 5, **caractérisé par le fait que** les lames (21) de l'hélice (20) sont disposées de manière asymétrique par rapport à l'axe de rotation.

8. Ventilateur d'extraction conformément à la caractéristique 6, **caractérisé par le fait que** les crochets (18) sont formés d'un encliquetage en U (18.1) se prolongeant par un ressort cylindrique (18.2) qui se prolonge à son tour par un seul crochet en forme de 4 (18.3).

9. Ventilateur d'extraction conformément à la caractéristique 6, **caractérisé par le fait que** les crochets (18) agissent, sur la position de travail, à travers l'une de leurs extrémités (18.1), sur la face intérieure d'un foret réalisé sur le mur où l'extracteur à ven-

tilation est monté, et à travers l'autre extrémité sur un crochet (18.3) serré par une bride (36) insérée sur le support (14) et logée dans un canal (34).

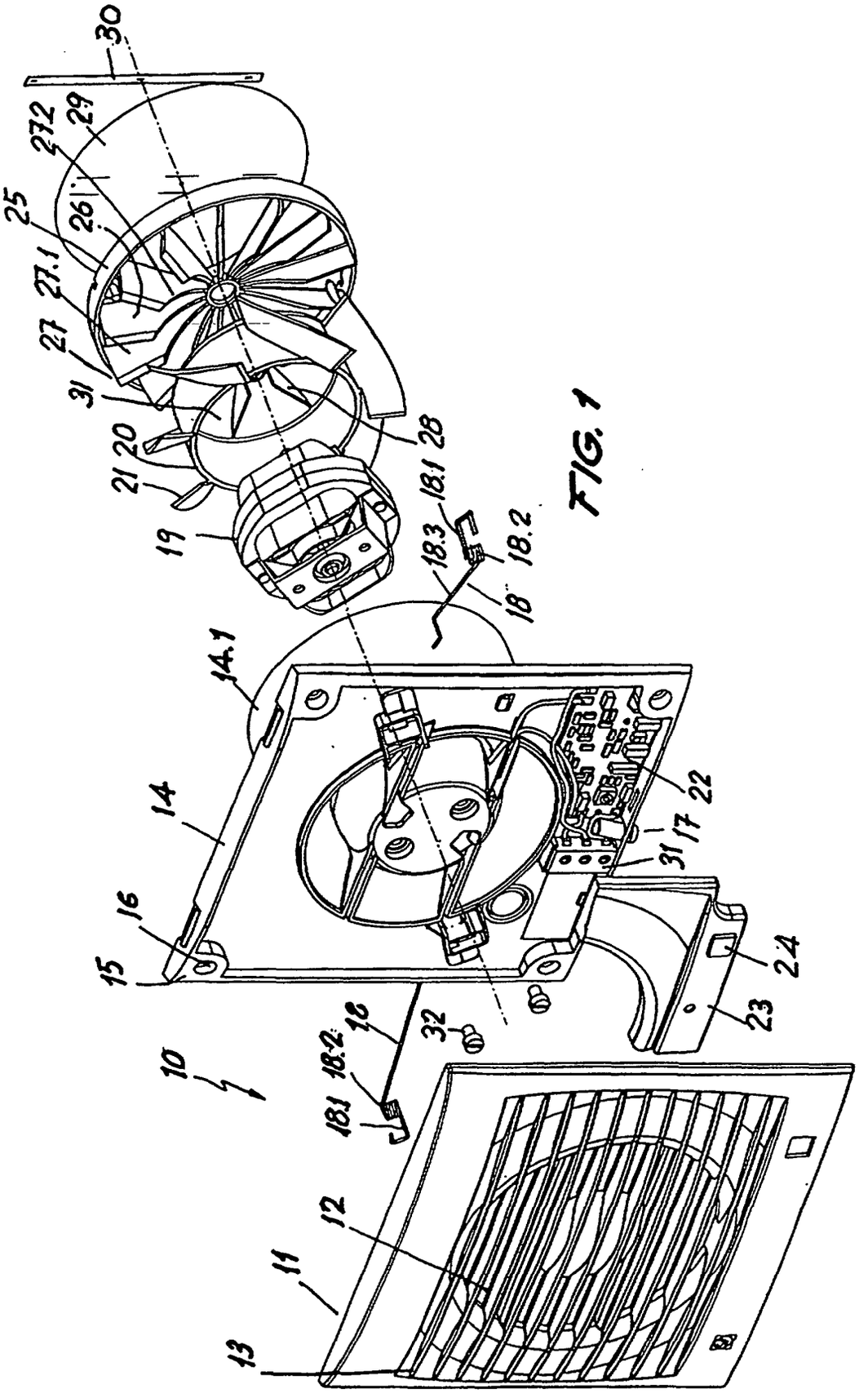
30
29
272
25
26
27.1
27
31
28
20
21
19
18.1
18.3
18.2
18
14.1
14
22
17
31
16
15
24
23
16
32
10
18.2
18.1
12
11
13

FIG. 1

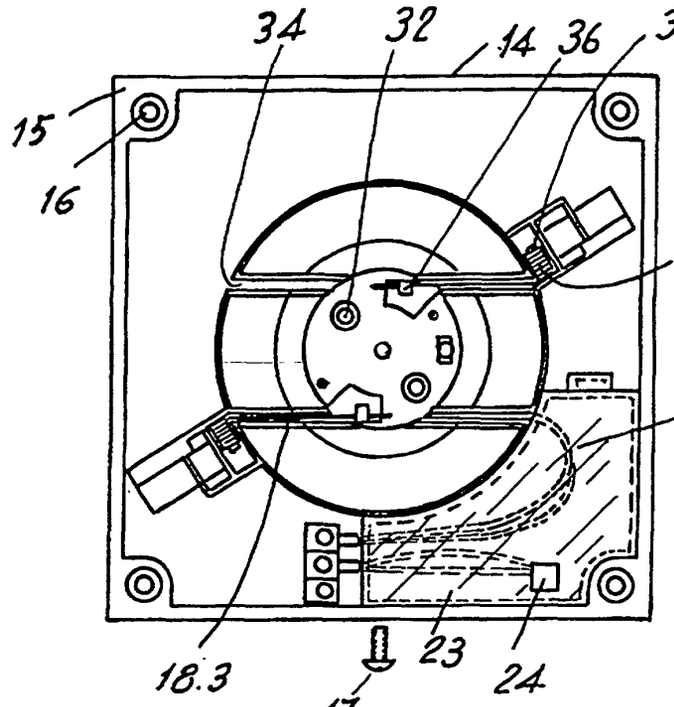

FIG. 2

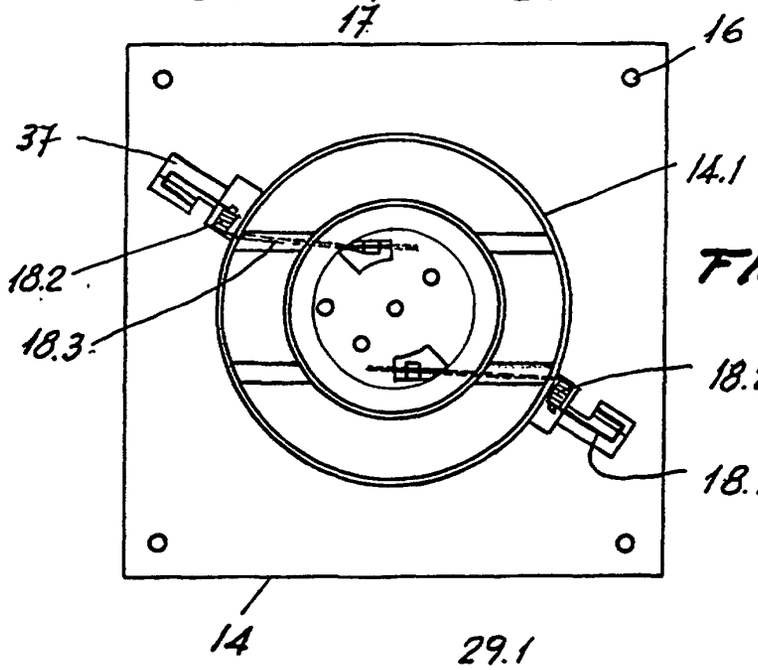

FIG. 3

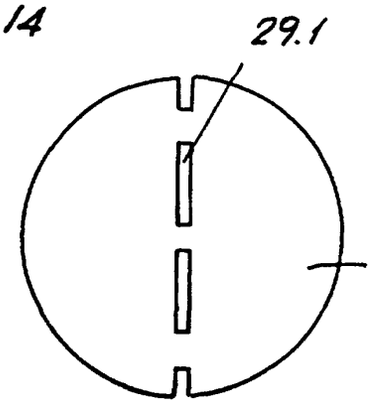

FIG. 4