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(54) Title: VALVE FOR INFLATION/DEFLATION

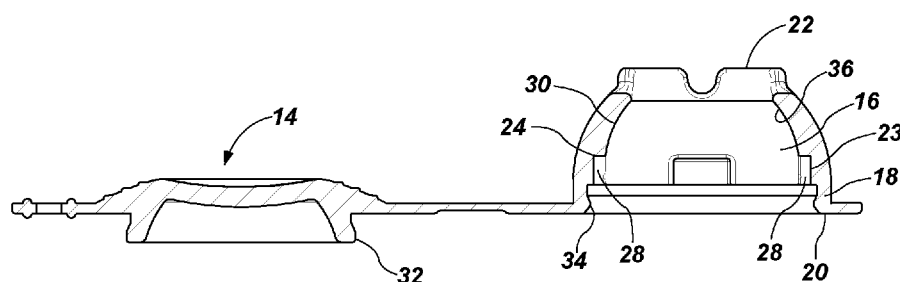


FIG. 2

(57) Abstract: Apparatus and method of a valve assembly that may be integrated into an inflatable device. The valve assembly may include a valve that is rotatable within a housing. The valve may allow for one-way passage of air either into or out of the inflatable device depending on the configuration of the valve. The valve system may provide an easy way to both inflate and deflate an inflation device with minimal effort from a user.



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 17/39550

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - F16K 1/00, F16K 1/16, F16K 1/18, F16K 1/22, F16K 15/03 (2017.01)

CPC - Y10T 137/5153, F16K 1/00, F16K 1/16, F16K 1/18, F16K 1/22, F16K 15/036, F16K 15/038, Y10T 137/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History Document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History Document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History Document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/0108556 A1 (Rose) 25 May 2006 (25.05.2006) entire document, especially Title, Abstract; figs. 1-12, para[0047]-[0049], [0055], [0059]-[0061].	1-2, 7-8
Y	US 4,296,772 A (Nillson) 27 October 1981 (27.10.1981) entire document, especially Title, Abstract, figs. 1-2, col 2, ln 16-67, col 3, ln 3-21.	1, 4-6
Y	US 4,004,614 A (Mackal et al.) 25 January 1977 (25.01.1977) entire document, especially Title, Abstract, figs. 1, 4-7, col 2, ln 6-30.	1, 3-6
Y	US 4,872,480 A (Scaramucci) 10 October 1989 (10.10.1989) entire document, especially Title, Abstract, figs. 1-5, col 2, ln 48-67, col 3, ln 1-20.	1, 3-4
A	US 2009/0183781 A1 (Song et al.) 23 July 2009 (23.07.2009) entire document.	1-8
A	US 8,844,563 B2 (Hawa) 30 September 2014 (30.09.2014) entire document.	1-8
A	US 2012/0227818 A1 (Steele) 13 September 2012 (13.09.2012) entire document.	1-8

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 17/39550

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-8, drawn to a valve assembly.

Group II: Claims 9-19, drawn to a system.

Group III: Claims 20-22, drawn to a method.

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:
--See Extra Sheet--

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-8

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

-.Box III ? Observations where unity of invention is lacking-.

SPECIAL TECHNICAL FEATURES

Group I has the special technical features of a valve assembly having a cap not required by Group II.

Group II has the special technical features of a system comprising a housing integrated with a portion of a perimeter of an inflatable device, not required by Group I.

Group III has the special technical features of a method comprising the steps of rotating the valve within the housing to a first configuration, wherein a first stop engages a first void; inflating the inflatable device by pushing air in a first one way direction from outside the inflatable device to inside the inflatable device; and preventing air from escaping from the inside of the inflatable device.

COMMON TECHNICAL FEATURES

The only technical features shared between Groups I-III share the features of an inflatable device, a housing configured to engage a valve, the valve configured to rotate about an axis within the housing which does not provide any contribution over the prior art as it is anticipated by US 2006/0108556 A1 to Rose.

Further Group I and Group III are related as an apparatus and a method of using an apparatus. The apparatus is known in the art as shown by Rose. Therefore, Groups I and III lack unity since the shared technical features do not represent a contribution over Rose.

Rose teaches a valve assembly (Title; Abstract; fig.1) comprising:
an inflatable device (38; fig. 6; para[0049]);
a housing (22; fig.1-2) integrated with the inflatable device (38; fig.6), the housing configured to engage a valve (20; fig. 1-2, 6);
a valve (20) configured to rotate about an axis (56) within the housing (22; para[0047]).

As the common features were known in the art at the time of the invention, they cannot be considered special technical features that would otherwise unify the groups.

Therefore, Groups I-III lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.