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Declarations under Rule 4.17:

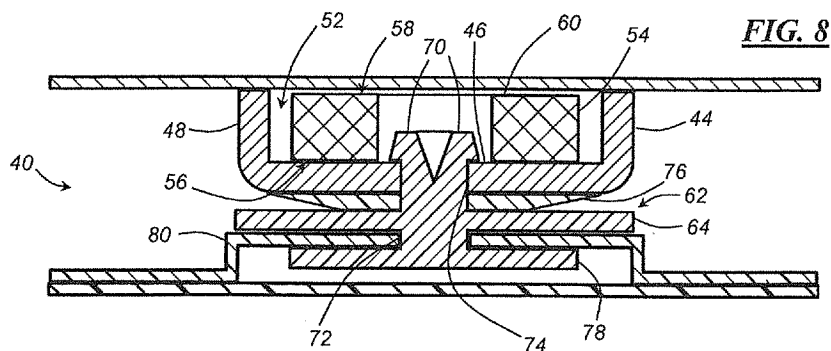
- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

- *with international search report (Art. 21(3))*

(88) Date of publication of the international search report:
13 March 2014

(54) Title: PERMANENT MAGNET PANEL FASTENER



(57) Abstract: A panel fastener and panel comprising a panel fastener that includes a support member having a magnet receiving space in which is mounted a single or multi-pole permanent magnet component presenting an exposed surface having at least one magnetic pole. The permanent magnet component may have a minimum ratio of surface area of the exposed surface to the volume of the magnet. The exposed surface of the permanent magnet component may include two or more polar surfaces of opposite magnetic domain that are located adjacent each other, and may have a polar intersection line that is at least one fourth of the length of the periphery of one of the polar surfaces.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2013/041471

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - H01F 7/02 (2013.01)

USPC - 24/303

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)

IPC(8) - B62D 27/06; E05C 19/16; H01F 7/02 (2013.01)

USPC - 24/303; 248/206.5; 269/8

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

CPC - B62D 27/06; E05C 19/16; H01F 7/0242 (2013.01)

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

Orbit, Google Patents, Google Scholar

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 049 580 B1 (PLACKETT et al) 02 May 1984 (02.05.1984) entire document	51
Y		1-15, 24-26, 48, 52-54
Y	US 2010/0301532 A1 (CARDONE et al) 02 December 2010 (02.12.2010) entire document	1-15, 24-26, 48, 52-54
Y	US 7,571,623 B2 (KRETCHMER et al) 11 August 2009 (11.08.2009) entire document	7
Y	US 4,779,314 A (AOKI) 25 October 1988 (25.10.1988) entire document	13, 14
Y	US 2011/0140474 A1 (SMITH et al) 16 June 2011 (16.06.2011) entire document	48
A	US 2009/0027149 A1 (KOCIJAN) 29 January 2009 (20.01.2009) entire document.	1-15, 24-26, 48, 51-54

☐ Further documents are listed in the continuation of Box C.


* 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

Date of the actual completion of the international search

26 November 2013

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2013/041471

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:

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.:
1-15, 24-26, 48, 51-54

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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2013/041471

Continuation of Box III.

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

Species I) first and second polar surfaces having a polar intersection line having a length that is at least one fourth the total length of the periphery of said first polar surface, Fig. 10

Species II) a ratio of surface area to volume for at least one magnetic region is greater than 0.38, page 2, lines 15-31

Species III) a first wall has a thickness, each magnetic region having a surface area ratio that is equal to a ratio of the surface area to the volume; and wherein a ratio of surface area ratio to the thickness of the first wall is greater than 0.27, page 3, lines 1-12

Species IV) a permanent magnet component has an annular shape and first and second polar surfaces; wherein each of said first and second polar surfaces are positioned adjacent to each other around the circumference of the annular shaped multi-pole permanent magnet component, and each of said first and second polar surfaces has a periphery defined by inner and outer arcs extending between a pair of radially-extending polar intersection lines, Fig. 18.

Species V) a base wall with an opening in the base wall; a permanent magnet extending around said opening; said permanent magnet component has a plurality of polar surfaces positioned about said opening such that they together present an exposed surface having alternating magnetic poles located adjacent each other, Fig. 16

The claims are deemed to correspond to the species listed above in the following manner:

Species I) Fig. 10; claims 1-15, 24-26, 48

Species II) page 2, lines 15-31; claims 16-19, 36-44, 49

Species III) page 3, lines 1-12; claims 20-23, 27-35, 50

Species IV) Fig. 18; claim 45

Species V) Fig. 16; claims 46-47

The following claims are generic: claims 51-54.

The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons:

Species I) figure 10; have the special technical feature of first and second polar surfaces having a polar intersection line having a length that is at least one fourth the total length of the periphery of said first polar surface. This special technical feature is not present in species II, III, IV or V.

Species II) page 2, lines 15-31; have the special technical feature of a ratio of surface area to volume for at least one magnetic region is greater than 0.38. This special technical feature is not present in species I, III, IV or V.

Species III) page 3, lines 1-12; have the special technical feature a first wall has a thickness, each magnetic region having a surface area ratio that is equal to a ratio of the surface area to the volume; and wherein a ratio of surface area ratio to the thickness of the first wall is greater than 0.27. This special technical feature is not present in species I, II, IV or V.

Species IV) figure 18; have the special technical feature of a permanent magnet component which has an annular shape and first and second polar surfaces; wherein each of said first and second polar surfaces are positioned adjacent to each other around the circumference of the annular shaped multi-pole permanent magnet component, and each of said first and second polar surfaces has a periphery defined by inner and outer arcs extending between a pair of radially-extending polar intersection lines. This special technical feature is not present in species I, II, III or V.

Species V) figure 16; have the special technical feature a base wall with an opening in the base wall; a permanent magnet extending around said opening; said permanent magnet component has a plurality of polar surfaces positioned about said opening such that they together present an exposed surface having alternating magnetic poles located adjacent each other. This special technical feature is not present in species I, II, III or IV.

Species I, II, III, IV and V lack unity of invention because even though the inventions of these species require the technical feature of a permanent magnet panel fastener, comprising: a support member having a first wall and one or more sidewalls defining a magnet receiving space of said support member; and a multi-pole permanent magnet component located in said support member within said magnet receiving space; said permanent magnet component presenting adjacent opposite magnetic poles at said open end of said magnet receiving space, wherein said opposite magnetic poles correspond to first and second polar surfaces each presenting one of said opposite magnetic poles and having a periphery that is adjacent the periphery of the other polar surface along a polar intersection line; wherein each of said magnetic regions have a volume and a surface area at said exposed surface, this technical feature is not a special technical feature as it does not make a contribution over the prior art in view of US 2009/0027149 A1 (KOCIJAN) 29 January 2009 (20.01.2009) entire document.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2013/041471

Continuation of Box III.

Kocijan teaches a permanent magnet panel fastener (magnetic lifting devices developed in the context of permanent magnets, [0002]; [0072-0073]), comprising: a support member having a first wall and one or more sidewalls defining a magnet receiving space of said support member (housing or carrier part 12 [first wall] in which are secured five individual permanent magnet coupling units 14, [0073]; [0077]; fig.1; axial end faces 35 and 34 surrounding magnets 20a and 20b, [0083]; fig.3; [the magnet configuration and axial end faces 34, 35 of figure 3 are recessed into housing or carrier part 12, the bottom of 12 forming the first wall; the sides of the recess forming the sidewalls]); and a multi-pole permanent magnet component located in said support member within said magnet receiving space (N and S magnet halves adjacent; fig.3a; two pole pieces 16,18 surround the periphery of the magnets, [0074]); said permanent magnet component presenting adjacent opposite magnetic poles at said open end of said magnet receiving space (see fig. 3a, showing N and S poles), wherein said opposite magnetic poles correspond to first and second polar surfaces each presenting one of said opposite magnetic poles and having a periphery that is adjacent the periphery of the other polar surface along a polar intersection line (see polar intersection line along diameter 26, fig. 3a; paragraph [0075]); wherein each of said magnetic regions have a volume and a surface area at said exposed surface (the volume of the annular magnets of fig. 3a is clearly defined by the annular magnet shape, any air gap between the magnets and the size of the pole pieces 16, 18, fig. 3b; see also figures 7a, 7b showing a linear array of multiple permanent magnet units, [0067]; a number of individual coupling units 14 disposed in a linear array wherein the units 14 are held spaced apart from one another by equal gaps, the polar axes PA of the individual units 14 being arranged in series and coaxially with one another such that the north and south poles of the activated units are arranged in alternating sequence, [0092-0093]; either the annular configuration of fig. 1, 3a, 3b or the linear configuration of fig. 7a, b has a surface area at face 14 with exposed alternating magnets as can be seen in the figures).

Since none of the special technical features of the Species I, II, III, IV and V inventions is found in more than one of the inventions, unity of invention is lacking.