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(73) Octrooihouder(s):
Jitka Zencáková te Brest, Tsjechië (CZ).

(72) Uitvinder(s):
Vojtech Zencak te Brest (CZ).

(74) Gemachtigde:
mr. ir. J. van Breda c.s. te Amsterdam.

(54) **Magnetic lifting device.**

(57) Magnetic lifting device (100) with permanent magnets, consisting of body (1.1) of stator (1) with permanent magnets, whereas the body (1.1) of stator (1) is a monobloc of magnetically conductive material, in the hole (1.4) of the body (1.1) of stator (1) there is a rotor (2) controlled by control lever (3), and stator (1) is associated with sliding lifting eye (7) . On the inside of the hole (1.4) for rotor (2) there a in the body (1.1) of stator (1) machined cells (14) dividing the body (1.1) of stator (1) in two parts (18,19) - two poles, whereas in the said cells (14) the permanent magnets (5) of the stator are installed, whereas the cells (14) are connected by bridges (15) of the residual material on the outside and/or inside surfaces (20).

NL C 2011224

Magnetic lifting device

Technology field

Technical design involves a lifting device with permanent magnets capable of magnetically attaching ferrous parts in active state and release the same ferrous parts when inactivated.

Current state of the art

Known lifting devices with permanent magnets contain a stator, consisting of two separate parts - left and right half, whereas these halves represent the imaginary magnetic poles - north and south. Upon basic coarse machining and upon installation of expansion inserts, these two parts are welded using non-magnetic material. Upon welding this stator must be once again machined into design shape, increasing the labor requirements of the product - together with welding.

From WO 99/65644 a lifting device is known, consisting of a stator and rotor, whereas the stator consists of a machined monobloc. This stationary monobloc has two slots machined on the outer surface under certain angle, into which permanent magnets of the stator are inserted, creating a magnetic field between the stator - rotor and the attached ferrous part (e.g. workpiece being transported). Disadvantage of this design lies in the fact that two slots must be machined on the outside of the stator for installation of the permanent magnets, whereas subsequently these two slots must be laboriously filled including the surface of the stator for final surface treatment or must be fitted with cover.

The basis of the technical design

The above disadvantages are eliminated to a significant degree by magnetic lifting device as proposed, consisting of a stator body with permanent magnets, where the stator body is a monobloc made of magnetically conductive material, with an opening in the body of the stator for installation of rotor, where the rotor is controlled between the active and inactive position by control lever and whereas a sliding lifting eye is associated with a stator body. The basis of the technical design is based on the fact that there are cells on the inside of the opening for rotor in the body of the stator, dividing the stator body in two parts - two poles for generation of magnetic field. Permanent magnets of the stator are in-

stalled in these cells. As the stator body is a monobloc, the cells on the outside and/or inside surfaces are connected by bridges of the remaining monobloc material. The design of the bridges, their number and cross-sections are designed considering the performance parameters of the lifting device and the properties of the materials used to generate the magnetic field of the lifting device.

In active status this magnetic lifting device transports ferrous parts from one place to another. To prevent unwanted release of the parts being transported, in addition to the basic locking of the rotor position in the active position, mechanically by control lever, securing clamp and control latch, there is another means of active mechanical locking according to the advantageous technical design. The said securing is realized by making two holes in the body of the stator, into which the end parts of the sliding lifting eye in the shape of a horseshoe are inserted. The holes made on the surface of the workpiece gripping area on the stator body have diameter larger than the diameter of the holes on the upper surface of the stator body, i.e. holes into which the sliding lifting eye is inserted. A locking bushing is inserted in each larger through hole in the direction from the workpiece gripping surface, with a leading edge on its outer diameter, whereas the said locking bushing is fixed to the face side of the end parts of the sliding lifting eye. Two locking slots and two relieving slots are made on the rotor placed inside the stator. Locking balls are engaged in the locking slots when the lifting device is activated. Locking balls are partially engaged in the relieving slots when the lifting device is inactivated.

The advantage of this technical design is the simplicity of the manufacturing and cost saving in the manufacturing of stator, simple attachment of the permanent magnets of the stator in the cells. The additional locking of the rotor by means of the movement of the suspension eye and locking ball significantly increases the stability of gripping and thus work safety.

Overview of the figures in the drawings

The technical design is clarified on the attached drawings that depict:

fig. 1 - perspective view of the lifting device
fig. 2a - perspective view of the lifting device stator body
fig. 2b - front view of the stator body from fig. 2a
fig. 2b - view A of the stator body from fig. 2b
fig. 3a - cross-section A - A across the sliding lifting eye, stator and rotor in fig.1 with rotor of the lifting device unlocked
fig. 3b - longitudinal cross-section B - B through sliding lifting eye, stator and rotor as per fig.1
fig. 3c - view of detail A from fig. 3a
fig. 4a - cross-section A - A across the sliding lifting eye, stator and rotor in fig.1 with rotor of the lifting device locked by two locking balls
fig. 4b - longitudinal cross-section B - B through sliding lifting eye, stator and rotor as per fig.1
fig. 5 - perspective view of the rotor with locking and relieving slots
fig. 5a - rotor elevation
fig. 5b - cross-section A-A- through fig. 5a

Examples of design

Magnetic lifting device 100 (fig.1 through 5b) consists of body 1.1 of stator 1, whereas in the body 1.1 permanent magnets 5 are placed. Inside the body 1.1 of the stator 1 there is a rotor 2 with permanent magnets 4. Body 1.1 is connected with sliding lifting eye 7 in the shape of horseshoe with associated locking bushing 20. Activation / inactivation of the magnetic lifting device 100 is provided by control lever 3 through part 2.4 of the rotor 2, extending beyond the body 1.1 of the stator 1.

The body 1.1 of stator 1 (fig. 2 through 2c) consists of a single whole - a monobloc made of soft magnetic iron. This body 1.1 has a base 1.2 of rectangular shape, comprising surfaces 1.3, by which ferrous workpieces 22, are gripped when the lifting device is activated. On the left and right longitudinal side of the body 1.1 of stator 1 there are to opposite oblique surfaces 11, 12. Between the oblique surfaces 11, 12 there is part 13, where sliding lifting eye is sliding and attached 7. Inside the body 1.1 of the stator 1 there is a hole 1.4 for the stator 2. On the outside of the hole1.4 for the stator 2 there are (milled) cells 14, whereas these cells 14

are milled across auxiliary holes 14.1. In the cells 14 permanent magnets 5 of the stator 1 are located. The cells 14 and auxiliary holes 14.1 divide the body 1.1 of stator 1 in two parts18, 19 – two poles - hypothetical magnetic poles N (north) and S (south) generating the magnetic field. These two parts 18, 19 are connected on the outside surfaces 21, alternative on the surfaces inside the body 1.1 of stator 1 by bridges 15 of the remaining material. These bridges the bridges15 - their number and cross-sections are designed considering the performance parameters of the lifting device and the properties of the materials used to generated the magnetic field of the lifting device.

Rotor 2 (fig. 5 through 5b) contains two slots 2.1 for placement of permanent magnets 4 of rotor 2. These two slots 2.1 are made opposite the cells 14 machined in the body 1.1 of the stator1. These two slots 2.1 are separated by rotor bridge 2.2 (fig.5). In the magnetic lifting device 100 the arrangement of permanent magnets 4 and 5 as showed in fig. 3a and 4a. On the outer diameter 2.6 of the rotor 2 in part where rotor bridge is located 2.2 there are two opposite locking slots 2.3 for engagement of locking balls 6 when the magnetic lifting device is inactivated (figs. 4a, 5, 5a, 5b). These locking slots 2.3 are set with respect to the axis of the permanent magnets 4 of the rotors at an angle of approximately 90^{o} . (Fig. 3a). To prevent damage of the outside diameter 2.6 of the surface of rotor 2 by locking balls 6 when the lifting device 100 is inactivated, on the outside diameter 2.6 of rotor 2 there are to opposite relieving slots 2.31. These relieving slots 2.31 are offset with respect to the locking slots 2.3 by an angle of about 10 to 20^{o}. These relieving slots 2.31 are not used for locking of the movement of rotor 2 when the lifting device is activated but when the lifting device is inactivated (fig. 3a), the locking balls 6 may be partially engaged by the relieving slots 2.31. The function of these balls 6 will be described next. In part 2.4 of the rotor 2 extending beyond body 1.1 of the stator 1 there is a through hole 2.5, with suspended control lever 3. The control lever 3 is used to activate/inactivate of the magnetic lifting device. Locking of the control lever 3 of rotor 2 is performed by known means, using the locking clamp 8, attached to the body of stator 1.

By partially pulling the lever 3 in the through hole 2.5 latch 10 is disengaged from the locking clamp 8 and subsequently the control lever may be moved, the same applies to both end positions of activation and inactivation.

Between the oblique surfaces 11, 12 of the body 1.1 there is a part 13, with two holes 16, 16.1, engaging the end parts 7.1 of the sliding lifting eye 7. These two through holes 16, 16.1 are of different diameter. The holes 16, used to engage the end parts 7.1 in the body 1.1 of stator 1 have smaller diameter than the diameter of holes 16.1 made from the surfaces 1.3, to which the ferrous part 22 is gripped. Locking bushing 20 is inserted in each larger through hole 16.1 from the surface 1.3 for gripping of workpiece. On the outer diameters of the locking bushings 20 there is a leading edge 20.1. This leading edge 20.1 is used to shift the locking balls 6 located in the space between the outside diameter of the locking bushings 20 and the outside diameter of 2.6 rotor 2. Inside diameter of the locking bushings 20 guide the ends 7.1 of the sliding lifting eye 7. These locking bushings 20, following the installation in the larger through hole 16 are fixed with the face side 7.2 of the ends 7.1 of the sliding lifting eye 7 and are subsequently blinded to provide a solid surface 1.3 for gripping of workpiece. On locking bushings 20 there is a recess 20.2, for spring 17. This spring 17 facilitates the return of the sliding lifting eye 7 in the initial position, i.e. in the position where the lifting device is not transporting load and is inactivated.

Description of the function of activation/inactivation of the lifting device and locking of the rotor movement and movement of the sliding lifting eye.

Before gripping the workpiece:

The control lever 3 is locked on one side of the locking clamp 8 (fig.1) and the locking bushings 20 with sliding lifting eye 7 in the basic position and locking balls 6 are locked in the area above the leading edge 20.2 of the locking bushing 20 (fig.3a). Permanent magnets of stator and rotor 4, 5 are arranged in such a way that the magnetic field is generated only between the stator and rotor. (Fig. 3a)

Gripping of workpiece:

For gripping of the ferrous workpiece 22 the control

lever 3 is released from the first latch 10 and moved by about 150 - 170^0 into second position engaging the second latch 10 of the locking clamp 8. This changes the polarity of rotor with respect to the stator, generating the magnetic field across the ferrous workpiece 22, where it remains gripped at the surface 1.3 of the lifting device 100 and may be transported to another position. As soon as the load is gripped to surface 1.3 and as soon the lifting is initiated by the sliding lifting eye 7, the sliding lifting eye 7 is slightly moved in axial direction together with locking bushings 20. Upon completion of the axial movement, the locking bushings 20 come into contact with surface 16.12 created by diameter 16.1 and 16. By this defined movement over hole 16.1, the locking bushings 20 with their leading edges 20.1 move the locking balls 6 from the space above leading edges 20.1 (fig. 3a) into locking slots 2.3 on rotor 2 (fig.4a). This enables locking of rotor 2 preventing voluntary undesirable disengagement of the control lever 3. When the locking balls 6 are engaged in the slot 2.3 on rotor 2, the control lever cannot be moved 3.

Releasing the ferrous workpiece:

To inactivate the lifting device, i.e. to release the ferrous workpiece 22 engaged by the surface 1.3 it is first necessary to apply pressure on the sliding lifting eye 7, which - together with locking bushings 20 is axially shifted over hole 16.1 into the basic position (obr.3a). By this axial shifting, the locking balls 6 are disengaged from the locking slots 2.3 on rotor 2 (fig. 4a) and are pushed out into the space above the leading edges 20.1 of the locking bushings 20. The prevent damage to the outside diameter of the 2.6 rotor surface 2 by disengaged locking balls 6, these balls may be partially engaged by the relieving slots 2.31. Upon this release of the locking balls 6 from the locking slots 2.3 the control lever 3 may be rotated by 170 ^{0} into the initial position before griping of the workpiece (fig.1) thus changing the polarity of the stator with respect to the rotor and the magnetic field across the ferrous workpiece 22 is eliminated, thus disengaging the ferrous workpiece.

CONCLUSIES

1. Magnetische hijsinrichting (100) met permanente magneten, bestaand uit het lichaam (1.1) van de stator (1) met permanente magneten, waarbij het lichaam (1.1) van de stator (1) uitgevoerd is als een monoblok van magnetisch geleidend materiaal; in de opening (1.4) van het lichaam (1.1) van de stator (1) is de rotor (2) geplaatst, bediend door een bedieningshendel (3), en waarbij aan de stator (1) een schuivende hijsoog (7) toegewezen is, **gekenmerkt** doordat vanuit de binnenkant van de opening (1.4) voor het plaatsen van de rotor (2) worden in het lichaam (1.1) van de stator (1) de kamertjes (14) gevormd, die het lichaam (1.1) van de stator (1) in twee delen (18,19) - twee polen - verdelen; in de genoemde kamertjes (14) zijn de permanente magneten (5) van de stator gelegd, waarbij de kamertjes (14) op de buiten- en/of binnenvlakken (20) door de bruggen (15) van het restmateriaal verbonden zijn.

2. Magnetische hijsinrichting volgens conclusie 1, **gekenmerkt** doordat de vorm van de bruggen (15), het aantal en doorsneden ervan, met inachtneming van de prestatieparameters van de hijsinrichting en de eigenschappen van materialen - gebruikt voor het maken van het magnetische circuit van de hijsinrichting - worden gekozen.

3. Magnetische hijsinrichtingen volgens conclusies 1 en 2, **gekenmerkt** doordat in het lichaam (1.1) van de stator (1) twee openingen (16, 16.1) zijn gemaakt, waardoor de einddelen (7.1) van het schuivende hijsoog (7) leiden, waarbij de openingen (16), waardoor de einddelen (7.1) in het lichaam (1.1) van de stator (1) ingevoerd worden, een kleinere diameter hebben dan de diameter van de openingen (16.1), gemaakt vanaf de oppervlakte van het vlak (1.3), waarop het ijzeren onderdeel (22) bevestigd is; in de openingen met een grotere diameter (16.1) zijn de arreteerbussen gelegd (20), en op de buitendiameters ervan zijn de aanloopranden (20.1) gemaakt, waarbij de arreteerbussen (20) vast verbonden zijn met de einddelen (7.1) van het schuivende hijsoog (7); op de buitendiameter (2.6) van de rotor (2) zijn twee borggroeven (2.3) en twee ontlastgroeven (2.31) gemaakt, waarbij in de borggroeven

(2.3) de arreteerkogels (6) zijn geschoven, als de magnetische hijsinrichting in actieve toestand is, en in de ontlastgroeven (2.31) de arreteerkogels (2.3) zijn geschoven, als de magnetische hijsinrichting gedeactiveerd is.

FIG.1

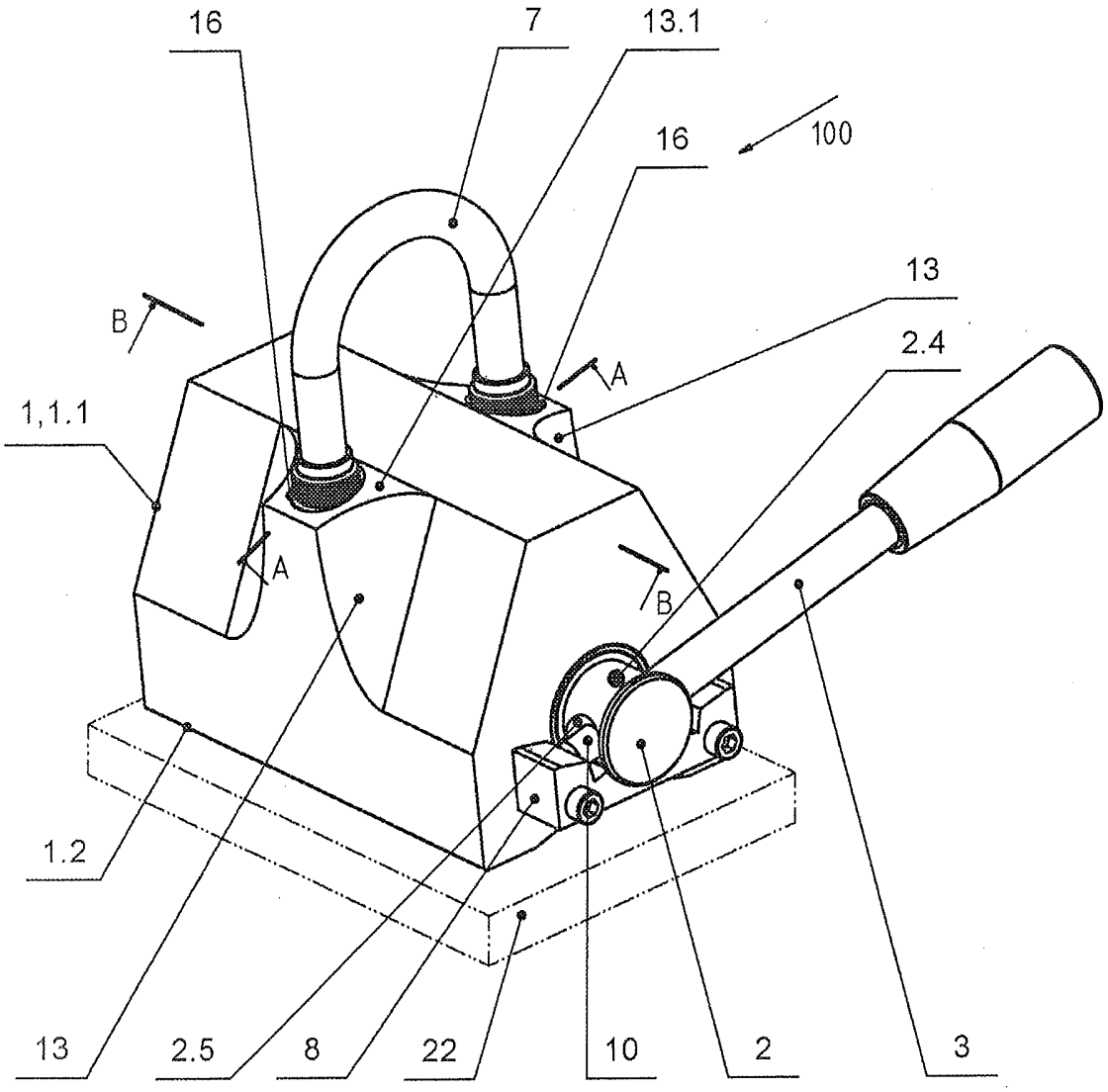


FIG. 2a

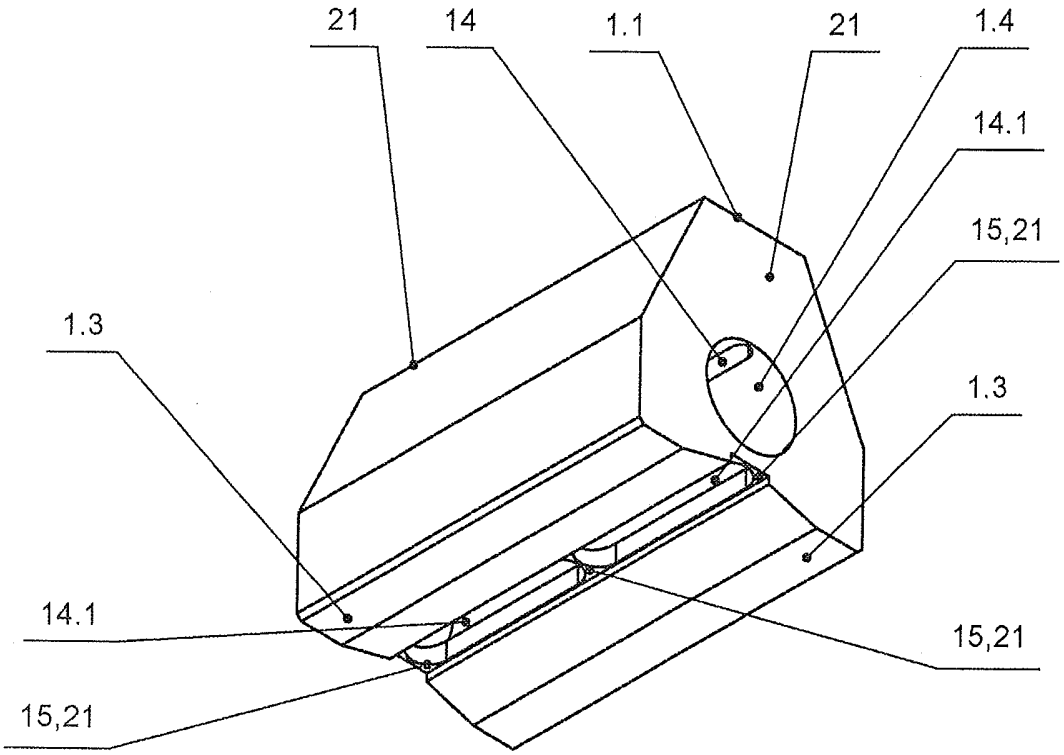
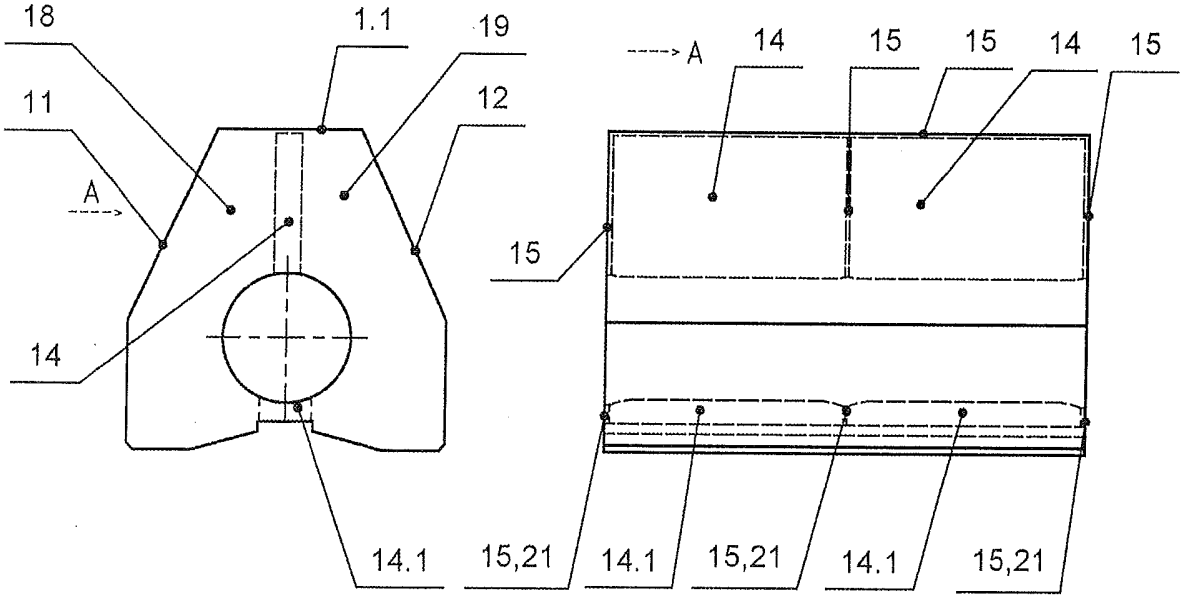


FIG. 2b

FIG. 2c



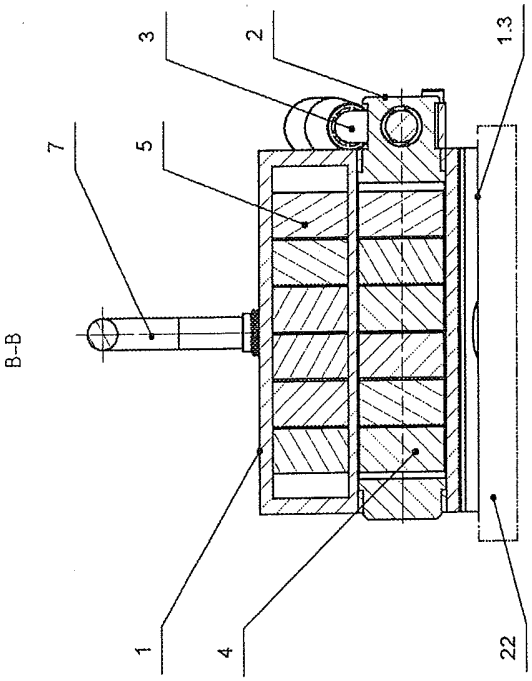


FIG. 3b

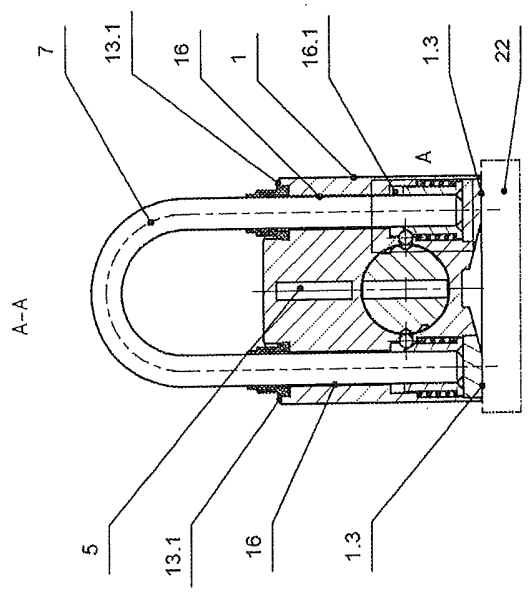


FIG. 3a

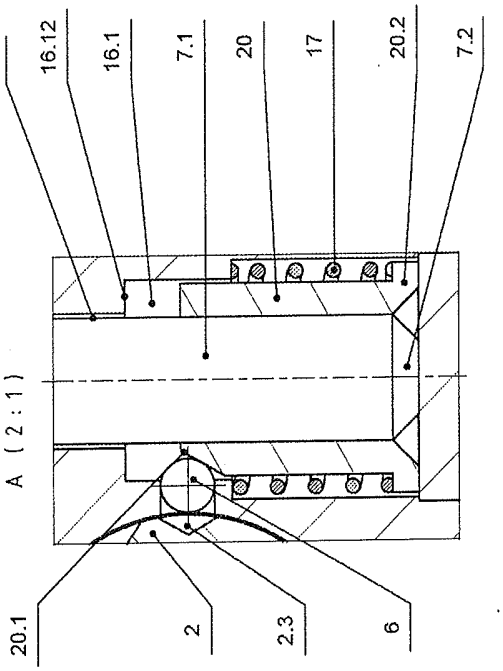


FIG. 3c

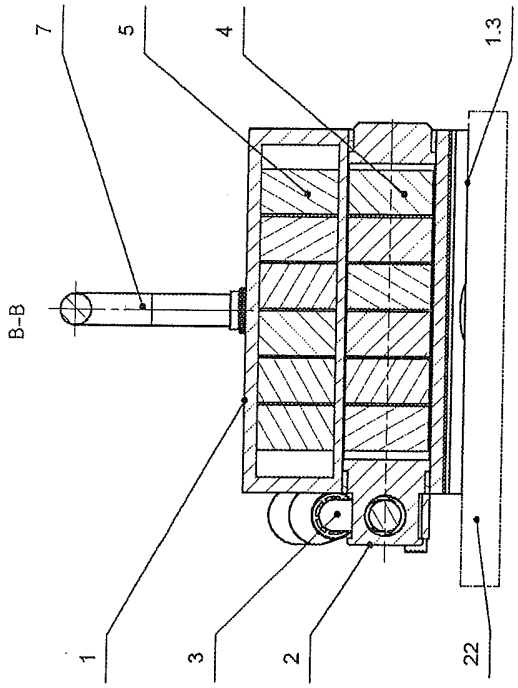


FIG. 4b

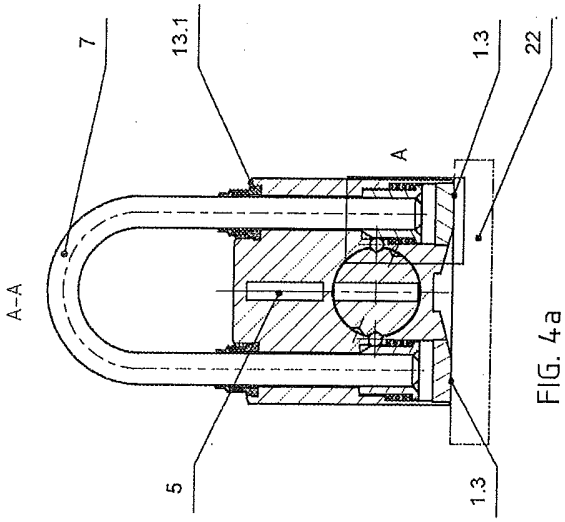


FIG. 4a

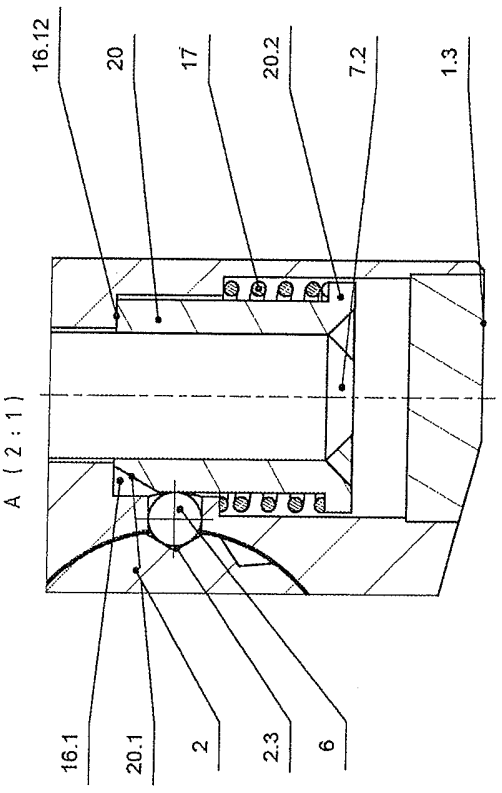


FIG. 4c

FIG. 5a

FIG. 5b

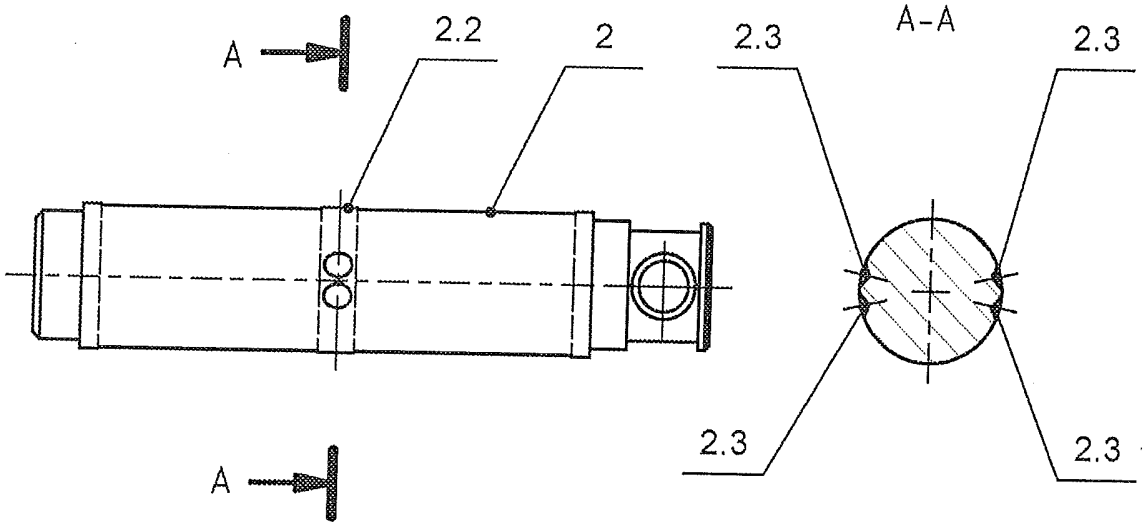
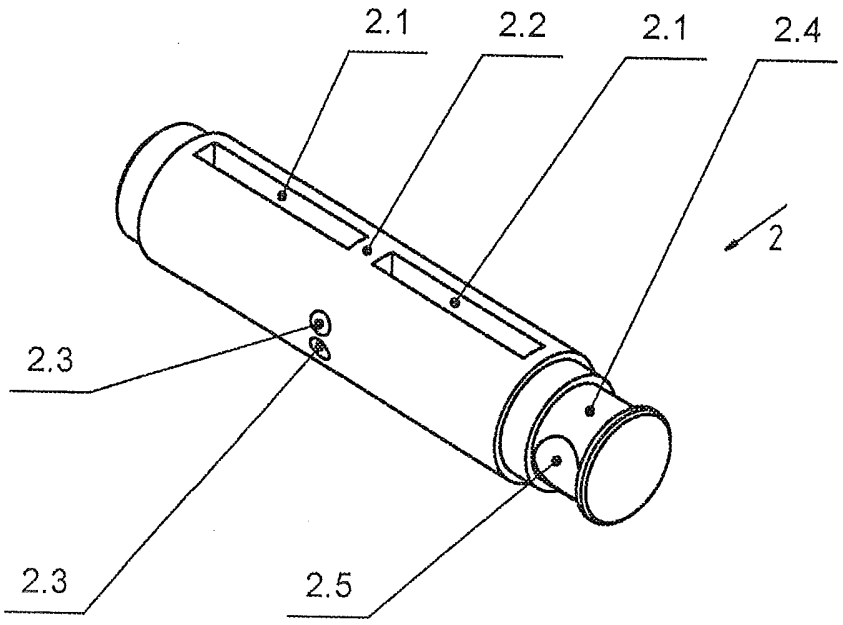


FIG. 5



Agentschap NL
Ministerie van Economische Zaken

OCTROOIAANVRAAG NR.:
NO 138772
NL 2011224

ONDERZOEKSRAPPORT

BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK

RELEVANTE LITERATUUR

Categorie[1]	Literatuur met, voor zover nodig, aanduiding van speciaal van belang zijnde tekstgedeelten of figuren.	Van belang voor conclusie(s) nr:	Classificatie (IPC)
A	WO 2011/097761 A1 (SOPH MAGNETICS SHANGHAI CO LTD [CN]; DING HONG [CN]) 18 augustus 2011 (2011-08-18) * het gehele document * -----	1-3	INV. B66C1/04 H01F7/02
A	JP S47 34963 U (UNKNOWN) 19 december 1972 (1972-12-19) * figuren * -----	1-3	
A,D	WO 99/65644 A1 (TECNOMAGNETE SPA [IT]; CARDONE MICHELE [IT]; GIGLIO ANTONINO [IT]) 23 december 1999 (1999-12-23) * het gehele document * -----	1-3	

Onderzochte gebieden van de techniek
H01F B66C

Indien gewijzigde conclusies zijn ingediend, heeft dit rapport betrekking op de conclusies ingediend op:

Plaats van onderzoek:	Datum waarop het onderzoek werd voltooid:	Bevoegd ambtenaar:
's-Gravenhage	13 mei 2015	Verheul, Omiros

[1] CATEGORIE VAN DE VERMELDE LITERATUUR

X: de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur
Y: de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht
A: niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft
O: niet-schriftelijke stand van de techniek
P: tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur
T: na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvrage, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding
E: eerdere octrooi(aanvrage), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven
D: in de octrooiaanvrage vermeld
L: om andere redenen vermelde literatuur
&: lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

EOB FORM 02.83 (P0414B)

AANHANGSEL BEHORENDE BIJ HET RAPPORT BETREFFENDE HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK, UITGEVOERD IN DE OCTROOIAANVRAGE NR.

NO 138772
NL 2011224

Het aanhangsel bevat een opgave van elders gepubliceerde octrooiaanvragen of octrooien (zogenaamde leden van dezelfde octrooifamilie), die overeenkomen met octrooischriften genoemd in het rapport.
De opgave is samengesteld aan de hand van gegevens uit het computerbestand van het Europees Octrooibureau per
De juistheid en volledigheid van deze opgave wordt noch door het Europees Octrooibureau, noch door het Bureau voor de Industriële eigendom gegarandeerd; de gegevens worden verstrekt voor informatiedoeleinden.

13-05-2015

In het rapport genoemd octrooigeschrift		Datum van publicatie	Overeenkomend(e) geschrift(en)		Datum van publicatie
WO 2011097761	A1	18-08-2011	CN	102574668 A	11-07-2012
			EP	2535307 A1	19-12-2012
			JP	2013519601 A	30-05-2013
			KR	20120109529 A	08-10-2012
			US	2013026774 A1	31-01-2013
			WO	2011097761 A1	18-08-2011
JP S4734963	U	19-12-1972	GEEN		
WO 9965644	A1	23-12-1999	AT	238880 T	15-05-2003
			CA	2300422 A1	23-12-1999
			CN	1274308 A	22-11-2000
			DE	69907377 D1	05-06-2003
			DE	69907377 T2	01-04-2004
			DK	1003625 T3	11-08-2003
			EP	1003625 A1	31-05-2000
			ES	2199577 T3	16-02-2004
			HK	1032767 A1	05-09-2003
			IT	MI981356 A1	15-12-1999
			JP	3869208 B2	17-01-2007
			JP	2002518268 A	25-06-2002
			KR	100427460 B1	27-04-2004
			PT	1003625 E	30-09-2003
			TW	490434 B	11-06-2002
			US	6292078 B1	18-09-2001
			WO	9965644 A1	23-12-1999

Algemene informatie over dit aanhangsel is gepubliceerd in de 'Official Journal' van het Europees Octrooibureau nr 12/82 blz 448 ev

SCHRIFTELIJKE OPINIE

DOSSIER NUMMER	INDIENINGSDATUM	VOORRANGSDATUM	AANVRAAGNUMMER
NO138772	26.07.2013	10.09.2012	NL2011224

CLASSIFICATIE
INV. B66C1/04 H01F7/02

AANVRAGER
Zencáková

Deze schriftelijke opinie bevat een toelichting op de volgende onderdelen:

- ☒ Onderdeel I Basis van de schriftelijke opinie
- ☐ Onderdeel II Voorrang
- ☐ Onderdeel III Vaststelling nieuwheid, inventiviteit en industriële toepasbaarheid niet mogelijk
- ☐ Onderdeel IV De aanvraag heeft betrekking op meer dan één uitvinding
- ☒ Onderdeel V Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid
- ☐ Onderdeel VI Andere geciteerde documenten
- ☐ Onderdeel VII Overige gebreken
- ☐ Onderdeel VIII Overige opmerkingen

	DE BEVOEGDE AMBTENAAR

Aanvraag nr.:

SCHRIFTELIJKE OPINIE

NL2011224

Onderdeel I Basis van de Schriftelijke Opinie

1. Deze schriftelijke opinie is opgesteld op basis van de meest recente conclusies ingediend voor aanvang van het onderzoek.

2. Met betrekking tot **nucleotide en/of aminozuur sequenties** die genoemd worden in de aanvraag en relevant zijn voor de uitvinding zoals beschreven in de conclusies, is dit onderzoek gedaan op basis van:

   a. type materiaal:

   ☐ sequentie opsomming

   ☐ tabel met betrekking tot de sequentie lijst

   b. vorm van het materiaal:

   ☐ op papier

   ☐ in elektronische vorm

   c. moment van indiening/aanlevering:

   ☐ opgenomen in de aanvraag zoals ingediend

   ☐ samen met de aanvraag elektronisch ingediend

   ☐ later aangeleverd voor het onderzoek

3. ☐ In geval er meer dan één versie of kopie van een sequentie opsomming of tabel met betrekking op een sequentie is ingediend of aangeleverd, zijn de benodigde verklaringen ingediend dat de informatie in de latere of additionele kopieën identiek is aan de aanvraag zoals ingediend of niet meer informatie bevatten dan de aanvraag zoals oorspronkelijk werd ingediend.

4. Overige opmerkingen:

Aanvraag nr.:

SCHRIFTELIJKE OPINIE

NL2011224

Onderdeel V Gemotiveerde verklaring ten aanzien van nieuwheid, inventiviteit en industriële toepasbaarheid

1. Verklaring

Nieuwheid	Ja:	Conclusies 1-3
	Nee:	Conclusies
Inventiviteit	Ja:	Conclusies 1-3
	Nee:	Conclusies
Industriële toepasbaarheid	Ja:	Conclusies 1-3
	Nee:	Conclusies

2. Citaties en toelichting:

Zie aparte bladzijde

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Document

Reference is made to the following document:

D1: WO 2011/097761 A1 (SOPH MAGNETICS SHANGHAI CO LTD [CN]; DING HONG [CN]) 18 augustus 2011 (2011-08-18)

2 Inventive Step

2.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1 and shows (the references in parentheses applying to this document):

Magnetische hijsinrichting (1) met permanente magneten, bestaand uit

- het lichaam (2) van de stator met permanente magneten (5), waarbij het lichaam (2) van de stator uitgevoerd is als een monoblok van magnetisch geleidend materiaal; in de opening (21) van het lichaam (2) van de stator is de rotor (81) geplaatst, bediend door een bedieningshendel (8),

from which the subject-matter of claim 1 differs from in that (ref.signs from application): aan de stator een schuivende hijsoog (7) toegewezen is, waarbij vanuit de binnenkant van de opening (1.4) voor het plaatsen van de rotor (2) worden in het lichaam (1.1) van de stator (1) de kamertjes (14) gevormd, die het lichaam (1.1) van de stator (1) in twee delen (18,19) - twee polen - verdelen; in de genoemde kamertjes (14) zijn de permanente magneten (5) van de stator gelegd, waarbij de kamertjes (14) op de buiten- en/of binnen- vlakken (20) door de bruggen (15) van het restmateriaal verbonden zijn.

2.2 The features of claim 1 are therefore new.

2.3 The problem to be solved by the present invention may therefore be regarded as an improvement design simplicity.

2.4 The solution proposed in claim 1 of the present application is considered as involving an inventive step because the technical design involves at least one blind slot with bottom and side walls (pocket), whereas a recess has been created between the faces of the cylindrical parts of the body and the first and

second cylindrical part. With respect to improvement of the magnetic flow of the permanent magnets of the rotor, it is better to create a flat surface on the outside of the cylindrical part of the body in part of the bottom of the blind slot along its entire length and width. Thickness of the bottom and side walls of the blind slot and the dimensions of the recess are proposed according to performance parameters and rotor dimensions. The advantage of the technical design is the simplicity of the manufacturing and saving of costs involved in the manufacturing of the rotor, solid and stable fixation of the permanent magnets of the rotor in the blind slot of the stator, application of liquid bonding materials without any other accessories or forms necessary to prevent the outflow of the bonding material, and there is no need for processing of the run out material.

2.5 The above features are neither known nor would their inclusion in order to solve the above problem be obvious to the skilled man.

2.6 The features of dependent claims 2-3 seem to be allowable as they disclose further features of the lifting clamp.