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(54) **Method for arranging a lithography system on a foundation, and lithography system arranged on said foundation.**

(57) The invention relates to a vibration isolation requiring system, such as a lithography system, arranged on a foundation, for example part of the floor in the room where the lithography system is arranged, and a method for arranging a lithography system on a foundation. The foundation is provided with a self-carrying base plate having one or more struts attached thereto. The one or more struts are attached to a side of said base plate that faces the foundation. The one or more struts are rigidly connected to the foundation by a curable resin material. This provides a base structure wherein the foundation is used as a reinforcing part of the base plate in order to obtain the desired stiffness. The said lithography system is arranged on top of said base plate.

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Dit octrooi is verleend ongeacht het bijgevoegde resultaat van het onderzoek naar de stand van de techniek en schriftelijke opinie. Het octrooischrift komt overeen met de oorspronkelijk ingediende stukken.

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Method for arranging a lithography system on a foundation,
and lithography system arranged on said foundation

BACKGROUND

The invention relates to a method for arranging a vibration isolation requiring system, such as a lithography system, on a foundation. The invention further relates to a vibration isolation requiring system, such as a lithography system, arranged on said foundation.

In lithography systems, for example in the manufacture of microelectronic devices (e.g. integrated circuits), the demands on accuracy and precision are extreme. Lithography involves the transfer of a pattern, used to define a layer of a microelectronic device, onto a surface of a suitable substrate such as a semiconductor wafer. Modern lithography systems are capable of providing patterns in which the pattern elements, as imaged or written on the substrate, having a sub-micron line width, e.g. less than one micrometer, on the substrate. Achieving such a high level of performance requires that all pattern transfer systems, positioning systems, and measuring systems of the lithography system operate at their absolute limits of performance. This level of performance also requires that

the components of said lithography system are mounted at an accurate and substantially fixed position with respect to each other.

One approach is to mount the components of such a system on top of a stiff sandwiched base plate, such as a honeycomb type mounting platform. The honeycomb structures are usually used in areas where a lightweight, high stiffness vibration-free surface is required. The typical construction of the honeycomb base plate comprises a top plate and a bottom plate with a honeycomb or web structure bonded in between. The structures are known to be quite stiff when exposed to compressive loads applied normal to the top plate of the platform and it provides a rigid separation between the plates. However, such a honeycomb base plate is very expensive, complicated in design, and require a long ordering time.

An other approach is to mount the components on a thick, substantially monolithic slab of granite. However in order to obtain the desired stiffness to carry a lithography system, such a slab needs to be relatively thick, typically more than 300 mm, and as a consequence will be extremely heavy.

It is an object of the present invention to provide a base structure for a lithography system which obviates one or more of the above mentioned disadvantages.

SUMMARY OF THE INVENTION

According to a first aspect, the invention provides a method for arranging a vibration isolation requiring system, such as a lithography system on a foundation, said method comprising the steps of:

providing a self-carrying rigid base plate having one or more struts attached thereto, wherein the one or more struts are attached to a side of said base plate that faces the foundation;

placing said base plate with its struts onto said foundation;

providing leveling means for adjusting the distance between the base plate and the foundation;

5 adjusting the distance between the base plate and the foundation in order to obtain a desired leveling of the base plate;

providing a curable resin material between the struts and the foundation;

10 curing said resin material in order to provide a rigid connection between the foundation and the struts; and

placing said system on top of said base plate.

Using this method a base structure is provided wherein the foundation is used as a reinforcing part of the
15 base plate in order to obtain the desired stiffness. In realizing that the foundation can be used as a reinforcing part for a base plate in a high precision environment, the rigid base plate of the base structure of the invention needs only to be self-carrying, that is having a sufficient
20 stiffness that the base plate substantially does not bent under its own weight. In this patent application, the foundation is a load-bearing part in a building for bearing the load of the lithography system, such as a lowest load-bearing part of the building or part of the floor in the
25 room where the lithography system is arranged.

Since the rigid base plate in itself does not need to be sufficient stiff to support the whole lithography system, the base plate can be of a relatively simple design. Such a base plate may be ordered and pre-installed by a
30 customer of said lithography system, without undue costs of (overseas) transport.

Since a curable resin material is used to provide a rigid connection between the foundation and the struts of said rigid base plate, the method of the invention allows
35 for fixing the base plate to an even rough and simple top surface of said foundation in a correct and strengthening manner. The leveling means can correct for any deviation of

said foundation from a flat, horizontal surface. In addition, the curable resin material fills any space between the struts and the foundation, and provides sufficient strength after curing to support the rigid base plate and
5 the system arranged on said base plate.

In an embodiment said method further comprising the step of removing the leveling means. Thus the leveling means are only required during the arrangement of the rigid base plate on the foundation and the connecting of said
10 struts of said base plate to said foundation by means of said curable resin material. After curing the leveling means can be removed. Said leveling means comprises, for example, one or more hydraulic lifting jacks, screw jacks or lifting screws.

15 In an embodiment said method further comprising the steps of:

providing a rim onto the foundation, which rim surrounds a foundation area for said base plate; and

providing said curable resin material onto the
20 foundation area as a pool of curable resin material, wherein the one or more struts are in contact with said pool of curable resin material, preferably wherein all struts are completely in contact with said pool of curable resin.

The resin material, after it has cured, provides a
25 substantially continue top layer of resin material covering said foundation area within the rim. Such a top layer of resin material provides a large adhesion surface, and thus a good adhesion to the foundation.

In an embodiment, said one or more struts are at
30 least partially submerged in said pool of curable resin material. This provides a mechanical bond between the struts and the top layer of resin material.

In an embodiment said curable resin material comprises an adhesive. This provides a chemical bond between
35 the struts and the top layer of resin material.

In a preferred embodiment said one or more struts are at least partially submerged in a pool of adhesive,

which provides both a mechanical and a chemical bond between the struts and the top layer.

Although the rim may be removed after the curing of said curable resin, it is preferred to use a decorative rim. By using a decorative rim, there is no need to remove the rim, which is a difficult procedure because the rim tends to stick to the curable resin material.

In an embodiment, said curable resin material is a material having a low or substantially no shrinkage during curing. In an embodiment, said shrinkage is less than one percent. Using a curable resin material with a low shrinkage so as to at least substantially maintain the absolute position between the rigid base plate and the foundation before, during and after the curing of the resin material. Furthermore, the use of a low shrinkage resin material substantially prevents the building up of any stress inside the resin material during the curing thereof.

In an embodiment, said curable resin material comprises a substantially non-shrinkable epoxy. In an embodiment, said epoxy comprises substantially no or a minimal amount of solvent.

In an embodiment, the one or more struts are releasable connected to the base plate. This embodiment allows for replacing a base plate once the struts are connected and/or bonded to the foundation. The releasable connection provides for an easy and relatively inexpensive upgrade facility.

It is preferred that the bottom surface of the base plate is substantially flat. Such a base plate with a flat bottom surface can be readily exchanged by an other base plate. Preferably also the top surface of the base plate is substantially flat.

In an embodiment, the foundation comprises a foundation plate or block. In an embodiment, the foundation plate or block is a concrete foundation plate or block, or a reinforced concrete foundation plate or block. Such a foundation plate or foundation block may be manufactured on

site.

In an embodiment, said base plate comprises a plate of granite. Since said base plate only needs to be self-carrying, the plate of granite can be relatively thin, in particular 150 mm or less, preferably 100 mm or less. Such a relatively thin granite base plate can be ordered locally, e.g. near to the site of the customer, and pre-installed on the foundation without undue costs of transport.

10 In an embodiment, said base plate is provided with mounting members at a top side for mounting the lithography system onto said base plate. The mounting members, such as interfaces or connectors, can be accurately positioned on said base plate in correspondence with the position of supporting members of said lithography system, enabling a quick installing of said lithography system onto said base plate.

In an embodiment, at least one strut is arranged below one mounting member, preferably below the centre line thereof. This provides for a direct transfer of the weight of the lithography system as carried by said mounting member, via said at least one strut to said foundation.

According to a second aspect, the invention provides a lithography system arranged on a foundation, wherein said foundation is provided with a self-carrying base plate having one or more struts attached thereto, wherein the one or more struts are attached to a side of said base plate that faces the foundation, wherein said one or more struts are rigidly connected to said foundation by a resin material, and

wherein said lithography system is arranged on top of said base plate.

Preferably said self-carrying base plate, is a rigid base plate. Preferably said resin material comprises a cured resin material.

In an embodiment, said one or more struts are at least partially submerged in said cured resin material.

In an embodiment said cured resin material comprises an adhesive.

In an embodiment, said cured resin material is a material having a low or substantially no shrinkage during
5 curing. In an embodiment, said shrinkage is less than one percent.

In an embodiment, said cured resin material comprises a substantially non-shrinkable epoxy.

In an embodiment, the one or more struts are
10 releasable connected to the base plate.

In an embodiment, the foundation comprises a foundation plate. In an embodiment, the foundation plate is a concrete foundation plate.

In an embodiment, said base plate comprises a
15 plate of granite.

In an embodiment, said base plate is provided with mounting members at a top side for mounting the lithography system onto said base plate. In an embodiment, at least one strut is arranged below one mounting member.

20 According to a third aspect, the invention relates to a base plate for supporting a vibration isolation requiring system, such as a lithography system, wherein the base plate comprises a bottom side that, in use, faces a foundation, wherein said bottom side is provided with struts
25 or at least is prepared for receiving struts, wherein said struts are arranged for rigidly connecting said base plate to the foundation, such as a concrete foundation block. The base plate of the invention may be kept much thinner in order to arrive at a sufficient stiffness for supporting a
30 vibration isolation requiring system. Advantages of such thinner base plate, apart from material and transportation costs, are that it may be produced quicker and transported more easily. In general a less complicated logistic preparation is required, e.g. the choice of transportation
35 means is considerably enlarged, as well as the choice in sites capable of manufacturing such a base plate.

In an embodiment, said struts are releasable

connected to said base plate. In this embodiment, the base plate may, if so desired, be easily and cost-effectively be replaced, for example in case of any system upgrade. Also, only a relatively small material part of the foundation
5 system needs to be sacrificed for such an update.

A further advantage of said releasable struts is that the foundation may be prepared and/or the struts may be connected to the foundation while the base plate is being prepared and/or transported. For preparing the foundation,
10 light weight, e.g. honeycomb stiffened mock-up plate may be used, rather than the original base plate. The mounting of the struts on to the foundation can be established without the presence of the base plate. When arrived, the base plate may instantly be positioned on the struts which are secured
15 to the foundation.

In an embodiment, said base plate is a self-carrying base plate.

In an embodiment, the base plate comprises a top side that, in use, faces the system, wherein said top side
20 comprises one or more mounting members or at least is prepared for having one or more mounting members attached thereto, wherein said mounting members are connectable between said base plate and said system. Said base plate is provided with mounting members at the top side for mounting
25 the system, such as a lithography system, onto said base plate.

In an embodiment, at least one of said mounting members is arranged at least partially in line with at least one of said struts. In an embodiment, at least one strut is
30 arranged below one mounting member.

In an embodiment, at least one of said struts is provided with anchoring members at a side facing away from said base plate.

In an embodiment, said plate is provided with
35 bores having a threaded insert fixedly received therein for connecting any of said struts and/or mounting members to said base plate.

In an embodiment, said base plate comprises a plate of granite.

According to a fourth aspect, the invention related to a use of the above mentioned base plate for
5 supporting a vibration isolation requiring system, such as a lithography system. An other example of such a vibration isolation requiring system is a microscope system, such as an electron microscope or an atomic force microscope.

The various aspects and features described and
10 shown in the specification can be applied, individually, wherever possible. These individual aspects, in particular the aspects and features described in the attached dependent claims, can be made subject of divisional patent applications.

15

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be elucidated on the basis of
20 an exemplary embodiment shown in the attached drawings, in which:

Figure 1 is a schematic presentation of a rigid base plate of the invention;

Figures 2 to 5 present a schematic side view of
25 various steps of a first example of a method for arranging a lithography system on a foundation, in particular a floor area; and

Figures 6 to 8 present a schematic side view of
various steps of a second example of a method for arranging
30 a lithography system on a foundation, in particular a foundation block.

DETAILED DESCRIPTION OF THE INVENTION

35

Figure 1 shows a self-carrying rigid base plate 1 for placing a lithography system onto a foundation. Said

base plate 1 may for example comprise a relatively thin honeycomb type mounting platform. However preferably the base plate 1 comprises a relatively thin monolithic plate of granite. The base plate 1 is provided with eight struts 5
5 attached to a bottom side 2 of said base plate 1 that, in use, faces the foundation.

The struts 5 are releasable attached to the bottom side 2 via screws or bolts. Each strut 5 comprises a substantially square cylinder having substantially flat side
10 walls, which are for example 10 cm high. The struts 5 are manufactured using a profiled or moulded wall material, in order to provide strong and/or rigid struts. The upper end and lower end of each strut 5 is provided with a flange 6. The flange 6 extends approximately 5 cm beyond the outer
15 side of the side walls of the strut 5. Between the flange at the upper end (not shown) and the flange 6 at the lower end, strengthening ribs 7 are provided. The strengthening ribs 7 are rigidly connected, for example by welding, to the upper and lower flange and to one of the side walls. In use the
20 ribs 7 extend substantially vertically between the upper and lower flange 6.

The lower flange 6 is used as an anchoring member for connecting the strut 5 to the foundation as described in more detail below.

25 The lithography system or a part thereof, may be mounted directly on top of the base plate 1 surface 3. In the embodiment shown in figure 1, the top side 3 of said base plate 1 is provided with mounting members 4 for mounting the lithography system, in particular the vacuum
30 chamber of said system, onto said base plate 1.

As shown in figure 1, the mounting members 4 are provided on a part of the base plate 1. This part is also provided with a cut-out 8 which provides space for mounting equipment underneath the vacuum chamber of the system, in
35 particular measuring equipment, such as a camera. In prior art base plates, such a cut-out 8 cannot be made because it considerably decreases the rigidity of the base plate. In

the base plate 1 of the invention, where the foundation or floor is used as a reinforcing part for a base plate 1, the cut-out 8 substantially does not lessen the rigidity of the base plate 1 which is connected to the foundation or floor.

5 In order to pass the weight of the vacuum chamber of the lithography system on to the foundation or floor one or more of the mounting members 4 are arranged above one strut 5.

10 As shown in figure 1, the struts 5 below the part of the base plate 1 which is provided with the mounting members 4 for mounting the vacuum chamber of the lithography system, are larger than the other struts. In this example, ten mounting members 4 are evenly arranged above the four large struts 5.

15 As shown in figure 1, a second part 9 of the base plate 1 is not provided with mounting members 4. This part 9 is used for mounting wafer handling equipment and actuators.

20 Before installing a lithography system, the above described base plate 1 is placed at the location where the system has to be installed. The base plate 11 with its struts 15 is arranged on a foundation 10, which is substantially separate from a surrounding floor 30. This can at least partially stop vibrations in or on the floor 30 from reaching the foundation 10 and be transmitted to the
25 base plate 11.

30 As shown in figure 2, the self-carrying rigid base plate 11, having one or more struts 15 attached thereto, is provided. The upper end of the struts 15 is provided with an upper flange 18 which is attached to a flat bottom side 12 of said base plate 11 that faces the foundation 10. The lower end of the struts 15 is provide with a lower flange 16, which acts as an anchoring member. As shown in figure 2, said base plate 11 is placed with its struts 15 onto said foundation 10. Furthermore the top side 13 comprises the
35 mounting members 14.

Subsequently leveling means 17, in particular screw jacks or lifting screws, for adjusting the distance

between the base plate 11 and the foundation 10, are provided. As shown in figure 3, the leveling means 17 are placed on top of blocks 19. The leveling means 17 are used for adjusting the distance between the base plate 11 and the foundation 10 in order to obtain a desired leveling of the base plate 11.

On the one hand, the curable resin material 21 can be provided locally, that is only at or near the anchoring members of the struts 15.

On the other hand, the curable resin material 21 can be made to cover the foundation area at and near the base plate 11. This option is chosen in the example in figure 4. Before providing the curable resin material 21, a rim 20 is placed onto the foundation 10, which rim 20 surrounds a area for said base plate 11. Subsequently the curable resin material 21 is provided onto the foundation area as a pool of curable resin material, wherein the anchoring members 16 of all struts 15 are wholly in contact with said pool of curable resin material 21. Said curable resin material 21 comprises a substantially non-shrinkable epoxy, such as a two-component epoxy (Rocapox EP™ from the firm Prokol) with or without a filler. This material has a low or substantially no shrinkage during curing, in particular a shrinkage of less than one percent.

As shown in figure 4, the curable resin material 21 is also provided between the anchoring members 16 of the struts 15 and the foundation 10. The anchoring members 16 of the all struts 15 are completely in contact with said pool of curable resin material 21. After the resin material 21 has set or cured, it provides a rigid connection between the floor 10 and the struts 15.

Now the leveling means 17 can be removed and the base plate 11 attached on the foundation 10 is ready to receive the lithography system 22, as schematically depicted in figure 5.

In a second example, as shown in figure 6, the location comprises a solid floor 30. The base plate 31 can

be placed directly onto that floor 30.

Furthermore, as shown in figure 6, the leveling means comprises one or more beams 39 which reach underneath the base plate 31, and wherein each beam 39 rests on two
5 hydraulic jacks 37 for adjusting the distance between the base plate 31 and the floor 30. As shown in figure 6, the hydraulic jacks 37 are placed at a distance from the base plate 31, outside the floor area that is destined to be covered by the curable resin material 40, as shown in figure
10 7. The hydraulic jacks 37 are used for adjusting the distance between the base plate 31 and the floor 30 in order to obtain a desired leveling of the base plate 31. Preferably the hydraulic jacks 37 are provided with mechanical locking or retaining members in order to secure
15 the position of the base plate 31 after leveling.

Before providing the curable resin material 41, a rim 40 is placed onto the floor 30, which rim 40 surrounds a floor area for said base plate 31. Subsequently the curable resin material 41 is provided onto the floor area as a pool
20 of curable resin material, wherein the flanges 36 which act as anchoring members of the struts 35 are all, substantially completely, in contact with said pool of curable resin material 41. Said curable resin material 21 comprises a substantially non-shrinkable epoxy that comprises
25 substantially no or a minimal amount of solvent, for example Rocapox EP™ from the firm Prokol. Alternatively an substantially non-shrinkable adhesive can be use.

As shown in figure 7, the curable resin material 41 is also provided between the anchoring members 36 of all
30 struts 35 and the floor 30. After the resin material 41 has set or cured, it provides a rigid connection between the floor 30 and the struts 35.

Now the leveling means 37, 39 and the rim 40 can be removed and the base plate 11 attached on the floor 30 is
35 ready to receive the lithography system 32, as schematically depicted in figure 8. The lithography system 32 is at its bottom side provided with a camera 33 which is arranged in

the cut-out 8 of the base plate 31 analogous as in the base plate 1 of figure 1.

Figures 5 and 8 thus show a lithography system 22, 32 arranged on a floor 30 or a foundation 10, wherein said floor 30 or foundation 10 is provided with a self-carrying rigid base plate 11, 31 having one or more struts 15, 35 attached thereto, wherein the one or more struts 15, 35 are attached to a side of said base plate 11, 31 that faces the floor 30 or foundation 10, wherein said one or more struts 15, 35 are provided with anchoring members at a side facing away from said base plate 11, 31, wherein said anchoring members are rigidly connected to said floor 30 or said foundation 10 by a cured resin material 21, 41, and wherein said lithography system 22, 32 is arranged on top of said base plate 11, 31.

In summary, the invention relates to a lithography system arranged on a foundation, for example part of the floor in the room where the lithography system is arranged, and a method for arranging a lithography system on a foundation. The foundation is provided with a self-carrying rigid base plate having one or more struts attached thereto. The one or more struts are attached to a side of said base plate that faces the foundation. The one or more struts are rigidly connected to the foundation by a cured resin material. This provides a base structure wherein the foundation is used as a reinforcing part of the base plate in order to obtain the desired stiffness. The said lithography system is arranged on top of said base plate.

It is to be understood that the above description is included to illustrate the operation of the preferred embodiments and is not meant to limit the scope of the invention. From the above discussion, many variations will be apparent to one skilled in the art that would yet be encompassed by the spirit and scope of the present invention.

C O N C L U S I E S

1. Werkwijze voor het plaatsen van een een
vibratie isolatie benodigend systeem, zoals een
lithografiesysteem, op een fundering, waarbij de werkwijze
de stappen omvat van:

- 5 het verschaffen van een zelfdragende rigide
basisplaat met een of meer steunen hieraan bevestigd,
waarbij de een of meer steunen zijn bevestigd aan een zijde
van de basisplaat die naar de fundering gekeerd is;
 het plaatsen van de basisplaat met haar steunen
10 op de fundering;
 het verschaffen van nivelleermiddelen voor het
instellen van de afstand tussen de basisplaat en de
fundering;
 het aanpassen van de afstand tussen de basisplaat
15 en de fundering voor het verkrijgen van de gewenste
vlakwaterpasstelling van de basisplaat;
 het verschaffen van een uithardend harsmateriaal
tussen de steunen en de fundering;
 het uitharden van het harsmateriaal voor het
20 verschaffen van een vaste verbinding tussen de fundering en
de steunen; en
 het plaatsen van het systeem boven op de
basisplaat.

2. Werkwijze volgens conclusie 1, verder
25 omvattend de stap van het verwijderen van de
nivelleermiddelen.

3. Werkwijze volgens conclusie 1 of 2, verder
omvattend de stappen van:

 het verschaffen van een rand op de fundering,
30 welke rand een funderingsgebied voor de basisplaat omringt;
en

 het verschaffen van het uithardend harsmateriaal
op het funderingsgebied als een poel van uithardend

harsmateriaal, waarbij de een of meer steunen elk in contact zijn met de poel van uithardend harsmateriaal.

4. Werkwijze volgens conclusie 3, waarbij de steunen ten minste ten dele ondergedompeld zijn in de poel
5 van uithardend harsmateriaal.

5. Werkwijze volgens conclusie 3 of 4, verder omvattend de stap van het verwijderen van de rand nadat het uithardende harsmateriaal is uitgehard.

6. Werkwijze volgens een der voorgaande
10 conclusies, met het kenmerk, dat het uithardende harsmateriaal een materiaal is met een lage of in hoofdzaak geen krimp gedurende het uitharden.

7. Werkwijze volgens conclusie 6, met het kenmerk, dat de krimp minder is dan één procent.

15 8. Werkwijze volgens conclusie 6 of 7, met het kenmerk, dat het uithardende harsmateriaal een in hoofdzaak niet krimpende epoxy omvat.

9. Werkwijze volgens conclusie 8, met het kenmerk, dat de epoxy in hoofdzaak geen of een minimale
20 hoeveelheid oplosmiddel omvat.

10. Werkwijze volgens conclusie 6, 7, 8 of 9, met het kenmerk, dat het uithardende harsmateriaal een kleefmiddel omvat.

11. Werkwijze volgens een der voorgaande
25 conclusies, met het kenmerk, dat de een of meer steunen losneembaar verbonden zijn met de basisplaat.

12. Werkwijze volgens een der voorgaande conclusies, met het kenmerk, dat de fundering een funderingsplaat omvat.

30 13. Werkwijze volgens conclusie 12, met het kenmerk, dat de funderingsplaat een betonnen funderingsplaat is.

14. Werkwijze volgens een der voorgaande conclusies, met het kenmerk, dat de basisplaat een
35 granieten plaat omvat.

15. Werkwijze volgens een der voorgaande conclusies, met het kenmerk, dat de basisplaat is voorzien

van monteringsorganen aan een bovenzijde voor het monteren van het lithografiesysteem op de basisplaat.

16. Werkwijze volgens conclusie 15, met het kenmerk, dat ten minste één steun onder één
5 monteringsorgaan geplaatst is.

17. Lithografiesysteem geplaatst op een fundering, waarbij de fundering is voorzien van een zelfdragende basisplaat met een of meer steunen daaraan bevestigd, waarbij de een of meer steunen zijn bevestigd
10 aan een zijde van de basisplaat die gekeerd is naar de fundering, waarbij de steunen vast verbonden zijn aan de fundering door een harsmateriaal, en

waarbij het lithografiesysteem is geplaatst op de bovenzijde van de basisplaat.

18. Lithografiesysteem volgens conclusie 17, verder omvattend een of meer van de kenmerkende elementen van conclusies 6 - 16.

19. Basisplaat voor het ondersteunen van een een vibratie isolatie benodigend systeem, zoals een
20 lithografiesysteem, waarbij de basisplaat een bodemzijde bevat die, in gebruik, naar een fundering gekeerd is, waarbij de bodemzijde is voorzien van steunen of ten minste is voorbereid voor het aanbrengen van steunen, waarbij de steunen zijn ingericht voor het vast verbinden van de
25 basisplaat met de fundering, zoals een betonnen funderingsblok.

20. Basisplaat volgens conclusie 19, waarbij de steunen losneembaar verbonden zijn met de basisplaat.

21. Basisplaat volgens conclusie 19 of 20, waarbij de basisplaat een zelfdragende basisplaat is.
30

22. Basisplaat volgens conclusie 19, 20 of 21, waarbij de basisplaat een bovenzijde omvat, die, in gebruik, naar het systeem gekeerd is, waarbij de bovenzijde een of meer monteringsorganen omvat of ten minste is
35 ingericht voor het hiermee verbinden van een of meer monteringsorganen, waarbij de monteringsorganen verbindbaar zijn tussen de basisplaat en het systeem.

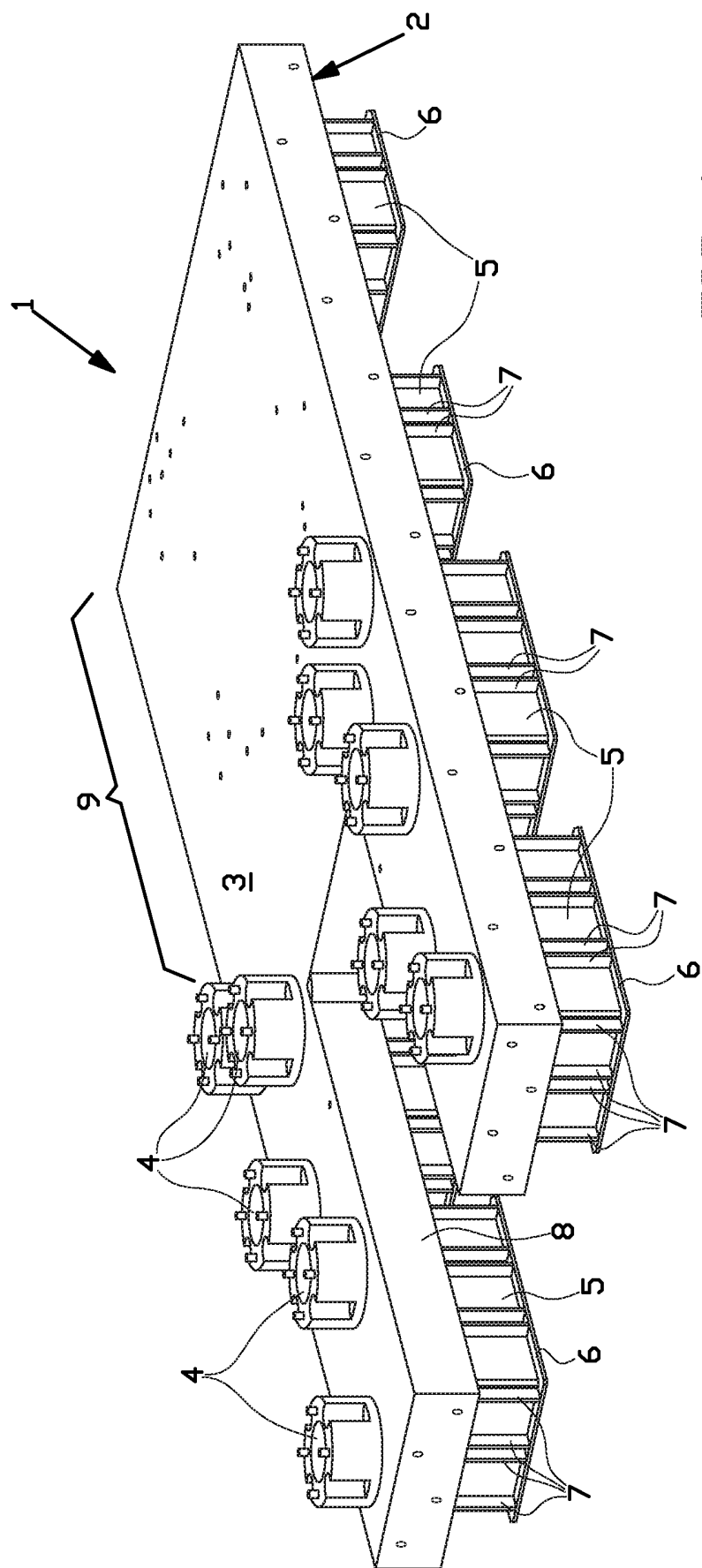
23. Basisplaat volgens conclusie 22, waarbij ten minste één van de monteringsorganen ten minste ten dele in lijn geplaatst is met ten minste één van de steunen.

5 24. Basisplaat volgens een van de conclusies 19 - 23, waarbij ten minste één van de steunen is voorzien van verankeringselementen aan een van de basisplaat afgekeerde zijde.

10 25. Basisplaat volgens een van de conclusies 19 - 24, waarbij de plaat is voorzien van gaten met een met schroefdraad voorzien insteekelement dat hierin vast geplaatst is voor het verbinden van een steun en/of monteringsorgaan met de basisplaat.

15 26. Basisplaat volgens een van de conclusies 19 - 25, verder omvattend een of meer van de kenmerkende elementen van conclusies 11, 14, 15 of 16.

-o-o-o-o-o-o-o-o-



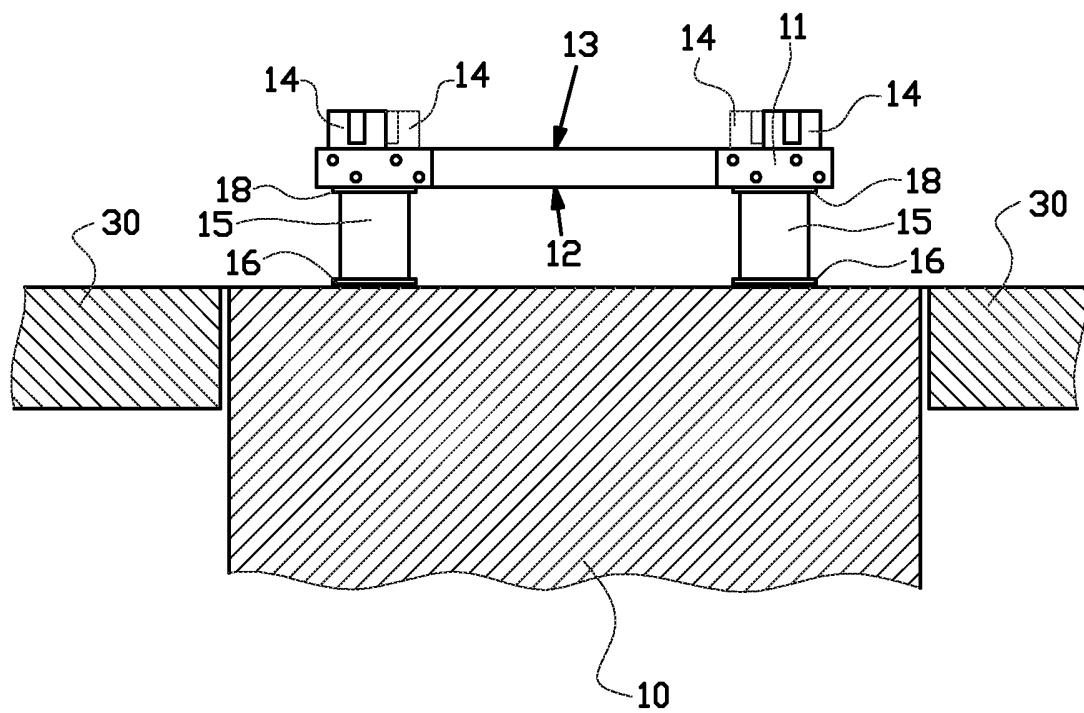


FIG. 2

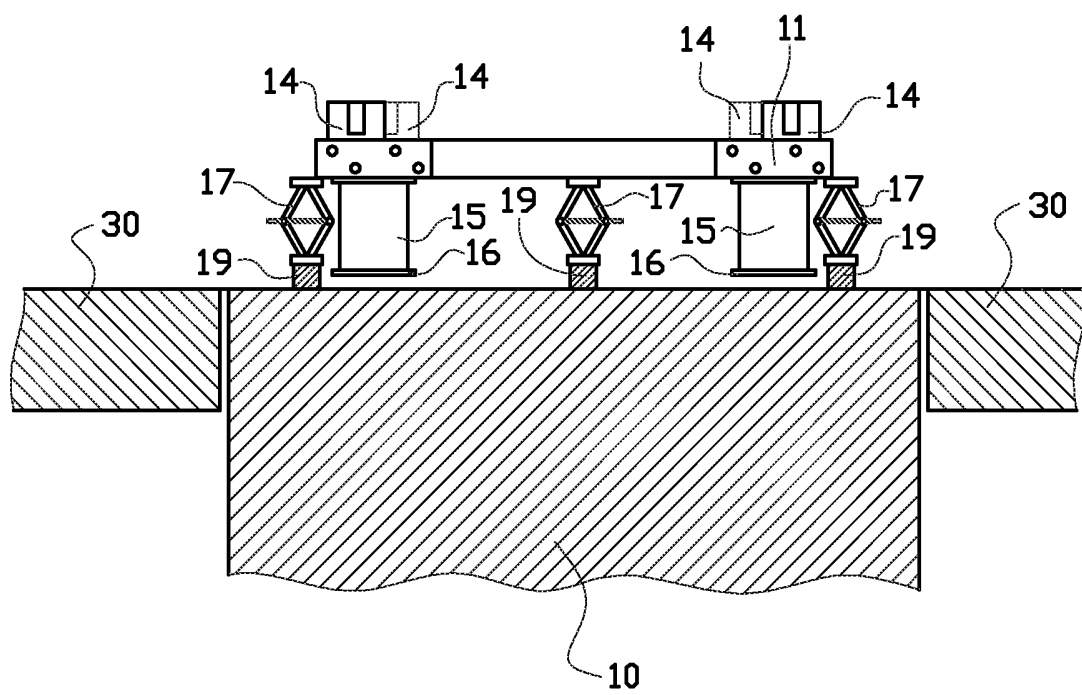


FIG. 3

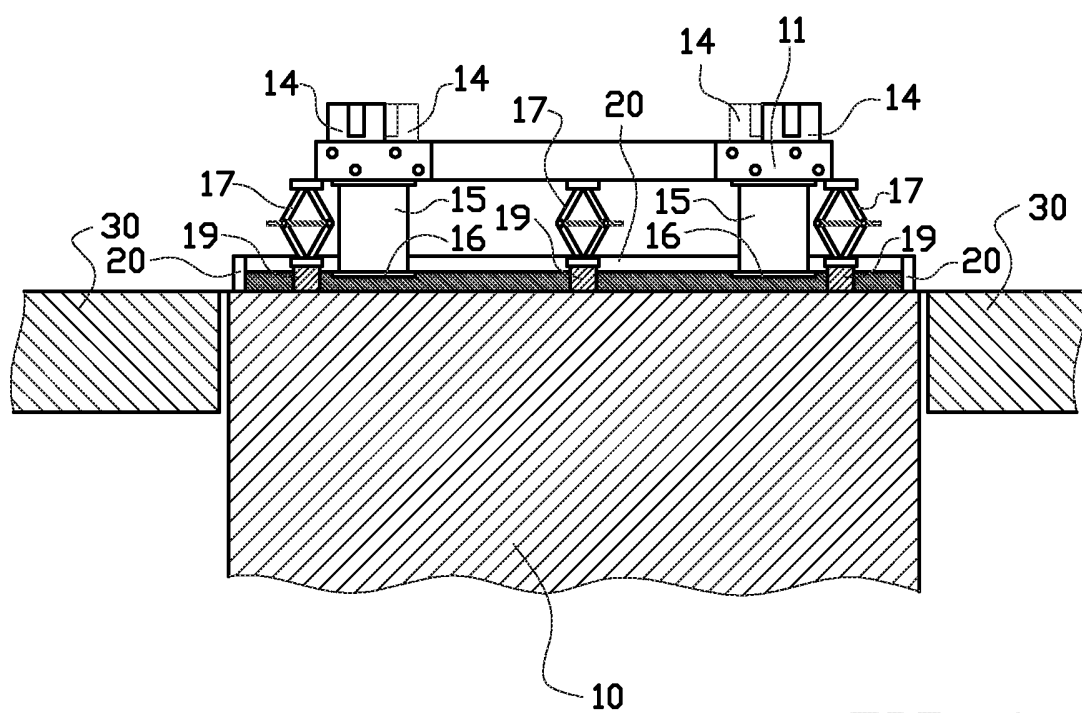


FIG. 4

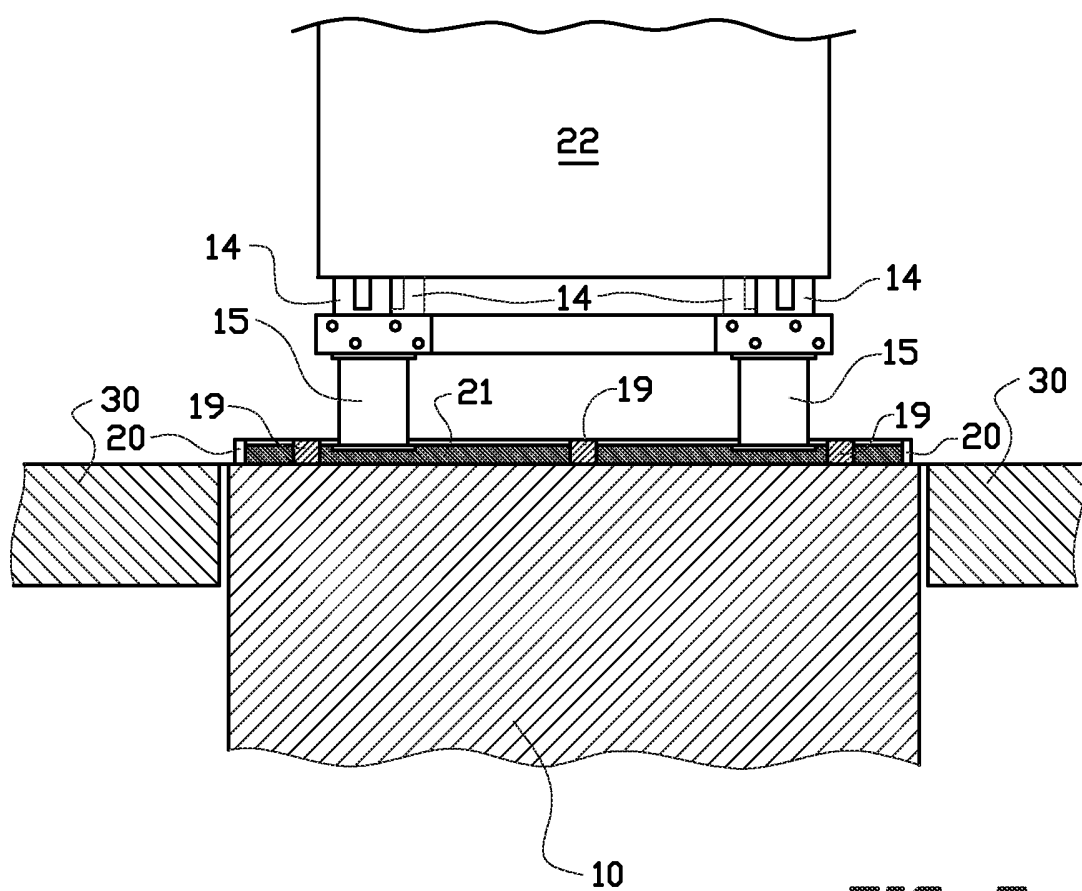


FIG. 5

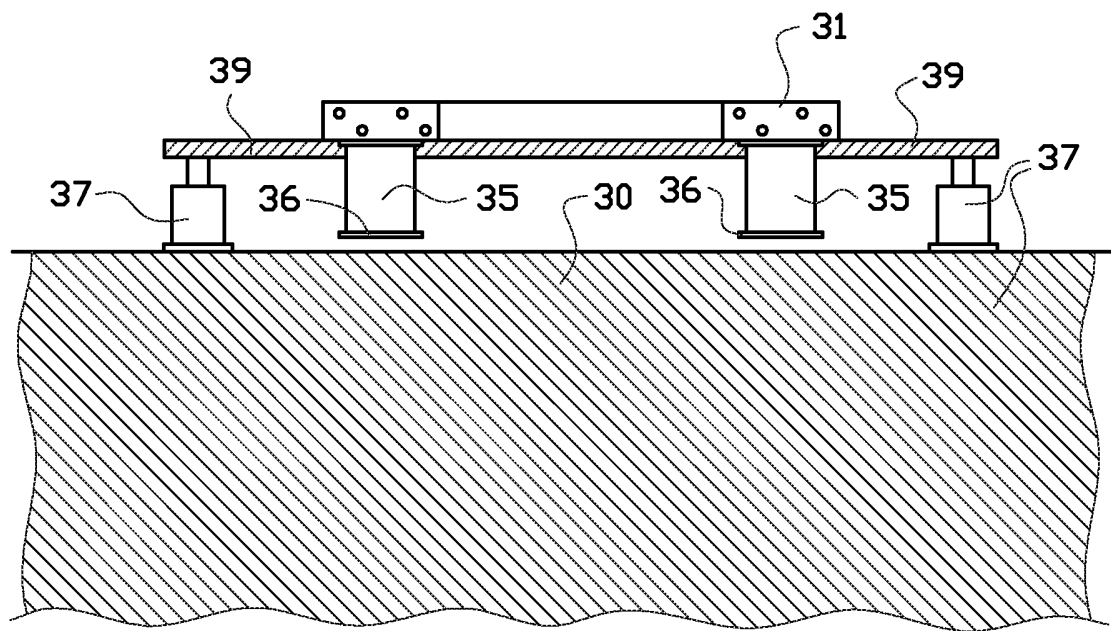


FIG. 6

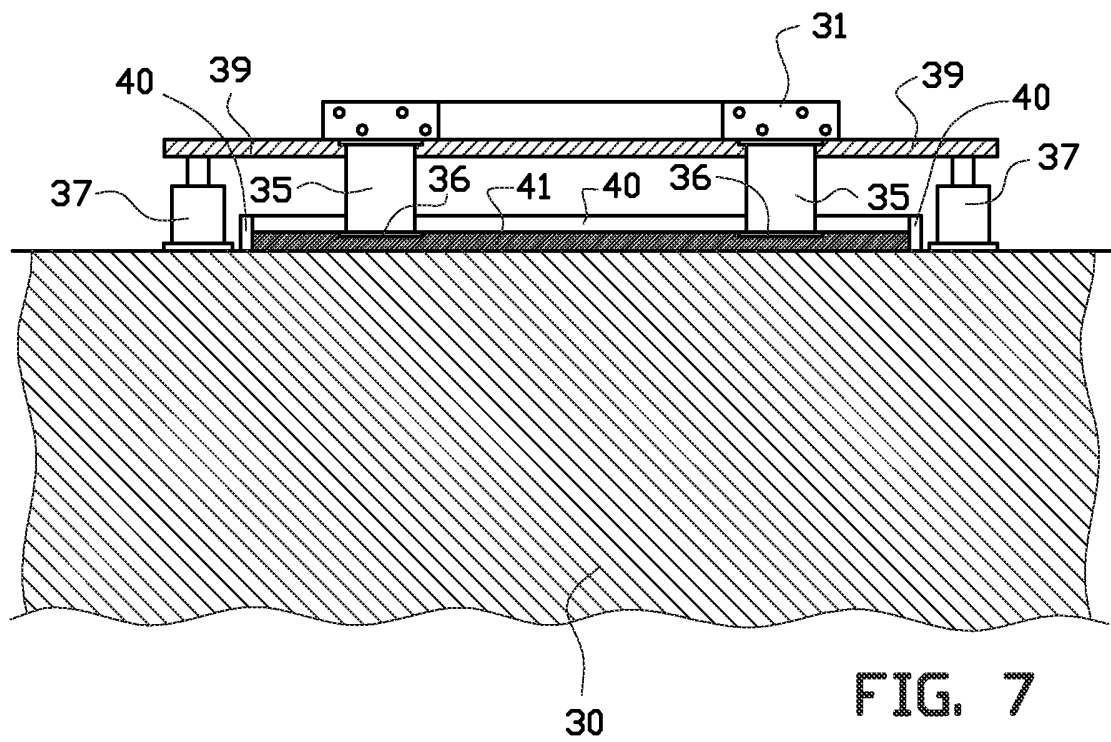
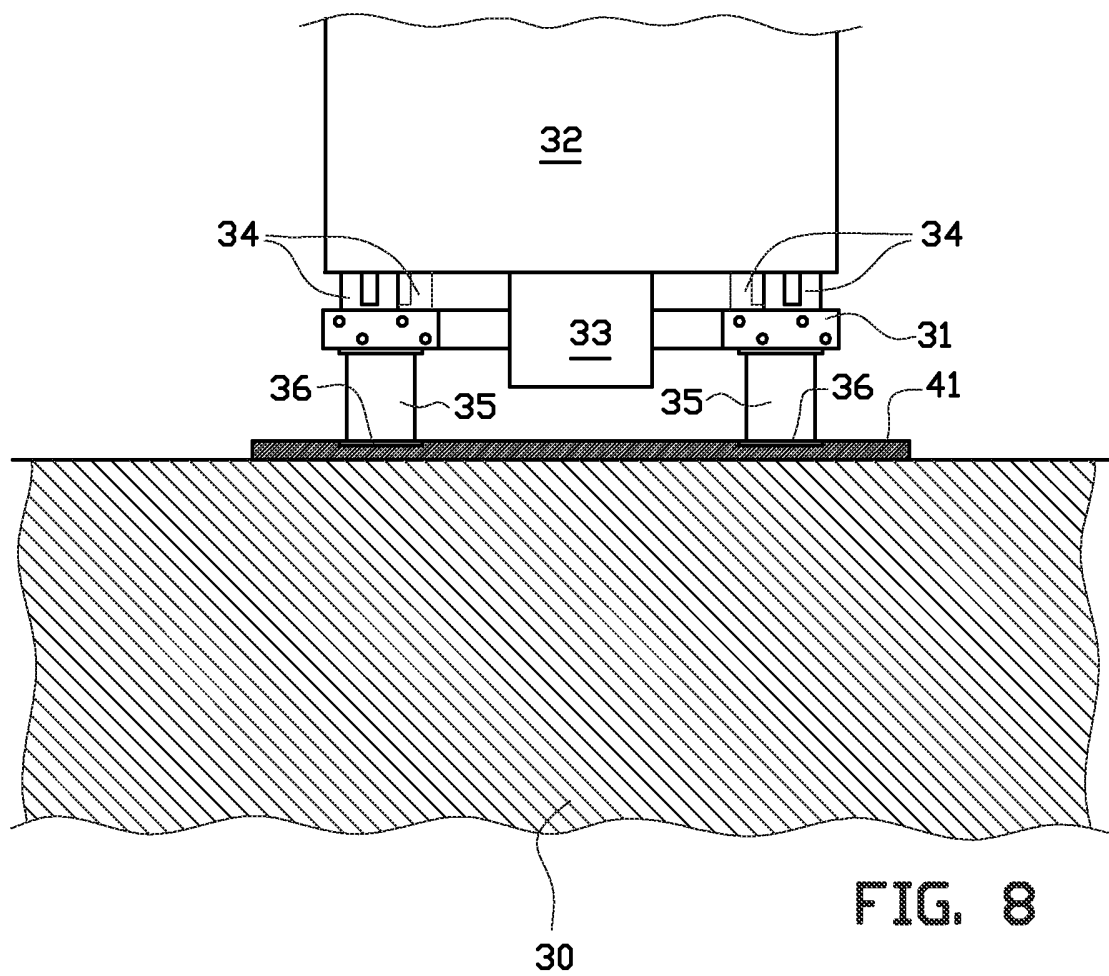
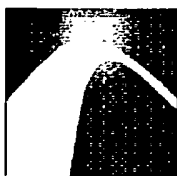


FIG. 7





OCTROOICENTRUM NEDERLAND

OCTROOIAANVRAAG NR.:

NO 137447

NL 2005374

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)
X	EP 1 143 492 A1 (NIPPON KOGAKU KK [JP]) 10 oktober 2001 (2001-10-10)	19-26	INV. G03F7/20
A	* alinea [0093] - alinea [0095]; figuren 1,2 *	1-18	
X	US 4 805 000 A (OGAWA KAZUFUMI [JP] ET AL) 14 februari 1989 (1989-02-14)	19-26	
A	* kolom 3, regel 31 - kolom 4, regel 62; figuur 1 *	1-18	
X	US 2004/149881 A1 (ALLEN DAVID S [US]) 5 augustus 2004 (2004-08-05)	19-21, 24-26	Onderzochte gebieden van de techniek G03F G02B F16M F24F
E	US 2010/263192 A1 (PHILLIPS ALTON H [US]) 21 oktober 2010 (2010-10-21)	19	
	* alinea [0037] *		
	* alinea [0046] - alinea [0048] *		
Indien gewijzigde conclusies zijn ingediend, heeft dit rapport betrekking op de conclusies ingediend op:			
Plaats van onderzoek: München		Datum waarop het onderzoek werd voltooid: 9 mei 2011	Bevoegd ambtenaar: van Toledo, Wiebo
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 octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding E: eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven D: in de octrooiaanvraag vermeld L: om andere redenen vermelde literatuur &: lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie			

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

NO 137447
NL 2005374

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.

09-05-2011

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
EP 1143492 A1	10-10-2001	AU 5447499 A WO 0014779 A1 US 6538719 B1	27-03-2000 16-03-2000 25-03-2003
US 4805000 A	14-02-1989	GEEN	
US 2004149881 A1	05-08-2004	GEEN	
US 2010263192 A1	21-10-2010	GEEN	



OCTROOICENTRUM NEDERLAND

SCHRIFTELIJKE OPINIE

DOSSIER NUMMER NO137447	INDIENINGSDATUM 20.09.2010	VOORRANGSDATUM	AANVRAAGNUMMER NL2005374
CLASSIFICATIE INV. G03F7/20			
AANVRAGER Mapper Lithography IP B.V.			

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 van Toledo, Wiebo
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SCHRIFTELIJKE OPINIE

Aanvraag nr.:

NL2005374

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:

SCHRIFTELIJKE OPINIE

Aanvraag nr.:

NL2005374

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

1. Verklaring

Nieuwheid	Ja: Conclusies 1-18 Nee: Conclusies 19-26
Inventiviteit	Ja: Conclusies 1-18 Nee: Conclusies 19-26
Industriële toepasbaarheid	Ja: Conclusies 1-26 Nee: Conclusies

2. Citaties en toelichting:

Zie aparte bladzijde

Onderdeel VI Andere geciteerde documenten

☒ Andere geciteerde openbaarmakingen

Zie aparte bladzijde

☐ Niet schriftelijke openbaarmakingen

Onderdeel VII Overige gebreken

De volgende gebreken in de vorm of inhoud van de aanvraag zijn opgemerkt:

Zie aparte bladzijde

Onderdeel VIII Overige opmerkingen

De volgende opmerkingen met betrekking tot de duidelijkheid van de conclusies, beschrijving, en figuren, of met betrekking tot de vraag of de conclusies nawerkbaar zijn, worden gemaakt:

Zie aparte bladzijde

Reference is made to the following documents:

- D1 EP 1 143 492 A1 (NIPPON KOGAKU KK [JP]) 10 oktober 2001
 (2001-10-10)
- D2 US 4 805 000 A (OGAWA KAZUFUMI [JP] ET AL) 14 februari 1989
 (1989-02-14)
- D3 US 2004/149881 A1 (ALLEN DAVID S [US]) 5 augustus 2004
 (2004-08-05)

Re Item V

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

Novelty

D1 discloses (Fig. 1) a base plate 58 for supporting a lithographic projection system in a vibration-free manner, the base plate 58 comprising a bottom side facing a foundation BP2, the bottom side having struts (legs 24) attached, the base plate further comprising a top side on which supporting columns 40 are mounted.

D2 discloses (Fig. 1) a base plate 20 comprising a bottom side facing a foundation 26, the bottom side having struts 54 attached, the base plate further comprising a top side on which a laser is mounted in a vibration free manner. Further, Fig. 1 shows a base plate 18 having at the bottom side legs 30 and at the top side mounting possibility for the frame 60.

D3 discloses (Figs. 1, 3 and 4) a support structure 20 for supporting an air conditioner, such that no vibration enters a housing, the support structure comprising a base plate 30 having a bottom side facing a foundation 36, the bottom side having struts (legs 24) attached.

Consequently, claim 19 is not new.

Since none of D1-D3 discloses the securing of the foundation side parts of the struts by means of a resin, claims 1 and 17 are new.

Inventive activity

Claim 19 not being new, its subject-matter does not rely on inventive merit.

Since none of D1-D3 suggests the securing of the foundation side parts of the struts by means of a resin, claims 1 and 17 are inventive.

Dependent claims

Claims 1 and 17 being new and inventive, also the claims dependent thereon are new and inventive.

Dependent claims 20-26 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of novelty and/or inventive step, the reasons being as follows:

claim 20: D3, the legs 26 are threaded, and can be secured to the bottom side of the base plate 30 by means of screws (Par. 0019);

claim 21: any of the base plate - strut ensembles of D1-D3 must be considered self-carrying, i.e. they can stand on their own;

claim 22: the base plate of D1 and D2 must be considered as having mounting members on the top side for securing the support columns and the laser or first mirror, respectively (D2 Col.3, lines 65-66: 'The first mirror 32 is mounted on support plate 20 through member 38.'). Such mounting members cannot be considered inventive in general as soon as a structure is to be mounted on top of the base plate;

claim 23: in D1, the support columns 40 and the struts 54 are partially arranged in line;

claim 24: any of the base plates of D1-D3 comprises an anchoring member to secure the struts to the foundation;

claims 25, 26: the legs of D3 being threaded (Par. 0019), the bottom side of the base plate must have a bore for releasably securing the leg.

Re Item VI

Certain documents cited

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (<i>valid claim</i>) (day/month/year)
US2010263192	21/10/2010	20/04/2010	20/04/2010

Re Item VII

Certain defects in the application

The relevant background art disclosed in D1-D3 is not mentioned in the description, nor is this document identified therein.

Independent claim 17 is not in the two-part form, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preamble and the remaining features ('said struts are rigidly connected to said foundation by a resin material') being included in the characterising part.

The features of claims 1, 17 and 19 are not provided with reference signs placed in parentheses.

Re Item VIII

Certain observations on the application

The last paragraph of the description ('spirit of the invention') renders the subject-matter unclear. It is understood that the invention is defined by the terms of the appended claims only.

Claim 17 is not clear, because it teaches that the lithography system is arranged on top of the base plate, while the foundation is said to face 'a side'. It is understood that the claim teaches that the foundation faces the bottom side of the base plate.