

The invention relates to a device for carrying out feed motion of a workpiece, in particular a bond head, towards a work station.

DE-PS 22 44 442 discloses an adjusting device
5 able to be activated substantially with electric means, which comprises a stator member as well as a rotor member. The surface facing the rotor member of the stator member is divided here into regions, each section of which has ribs extending parallel relative
10 to each other made of magnetizable material. On the lower side of the rotor member there are arranged electromagnetic means cooperating with the named sections, such that when the electromagnetic means are excited a movement of the rotor element in the X
15 direction or Y direction occurs. Between the rotor element and the stator element furthermore an air intermediate chamber can be provided, so that the rotor element formed as a head piece hangs substantially on an air cushion over the stator element formed as a
20 plate.

A device is known from US-A 4 654 571 which comprises substantially a platform formed to receive a circular disc-shaped semi-conductor element. The platform is mounted on a flat plate by means of three
25 brackets arranged spaced relative to each other and formed as an air bearing. The semi-conductor element lying on the platform is exposed correspondingly in this by an associated photo part by means of a photo mask. The plate is provided on the side facing the
30 platform with magnetic elements arranged distributed extensively over the whole surface and the platform on the side facing the plate or the magnetic element is provided with four coil bodies arranged symmetrically to the vertical axis of the platform. By means of the
35 magnetic element and the coil element, with corresponding excitation, the platform is able to be

moved in the X direction and Y direction in the plane relative to the plate. The air bearing occurs corresponding to US-A 4 654 571 exclusively by pressure air exiting from a cross-shaped slit. As a result of
5 this however no accurate air bearing is possible.
Furthermore through a checker-board like arrangement of magnetic elements which cooperate with corresponding coils in a body, the accuracy of the movement of a work element, as is required for a generic feed device, can
10 never be achieved.

One object of the invention is to create a device which, with simple means, enables accurate feed motion of the support element, provided with a workpiece, towards the working station, said motion
15 being highly dynamic and ensured against forces acting vertically on the support element.

According to the invention, this object is achieved with the features of claim 1.

Exemplary embodiments as well as advantageous
20 developments and further features essential to the invention are found in the following description in connection with the drawing and the individual claims.

The invention will be described in the following with the aid of the drawing.

25 Figure 1 shows a first exemplary embodiment, represented in a diagrammatic manner, of a device for carrying out feed motion of a workpiece towards a work station;

Figure 2 shows a second exemplary embodiment, represented in a diagrammatic manner, of the device for
30 carrying out feed motion of the workpiece;

Figure 3 shows a third exemplary embodiment shown in a diagrammatic manner, of the device for carrying out feed motion of the workpiece,

35 Figure 4 shows in an enlarged scale and in perspective view a device according to Figure 1,

Figure 5 shows a lower side of a support element for the workpiece, represented diagrammatically following the arrow direction V in Figure 4,

Figure 6 shows a guide device for the device
5 according to claim 1, represented in section following the line VI-VI in Figure 4,

Figure 7 shows a bottom view of a guide part for the device according to Figure 1, represented diagrammatically following the arrow direction VII in
10 Figure 4,

Figure 8 shows a front view of the guide part for the device according to Figure 1, represented diagrammatically following the arrow direction VIII shown in Figure 4,

Figure 9 shows a first, diagrammatically represented, variant of the guide device for the device
15 according to Figure 1 or Figure 3,

Figure 10 shows a second, diagrammatically represented, variant of the guide device for the device
20 according to Figure 1 or Figure 3,

Figure 11 shows a section following line XI-XI through the guide device according to Figure 10,

Figure 12 shows a diagrammatically represented measuring device for the device according
25 to Figure 1 and Figure 4.

In Figures 1, 2 and 3 in order to illustrate the invention as a general system overview there is represented in a diagrammatic manner in each case a device denoted as a whole by 100, 100' or 100'', said
30 device being formed for carrying out feed motion of a workpiece (not shown in Figures 1 to 3) towards a work station. The feed motion of the workpiece to a correspondingly associated transport band 110 (only shown in Figure 1) or the like occurs here
35 approximately along two coordinates, directed in the plane approximately at right angles relative to each

other in the X direction and/or Y direction.

The device 100 according to Figure 1 comprises substantially a base plate 10, a sliding plate 15, a support element 20 for the workpiece not shown in more detail, a first drive 25 for feed motion of the support element 20 directed in the Y direction and a second drive 30 for feed motion of the support element 20 directed in the X direction, as well as a guide device 50 in operative connection with the support element 20. The support element 20 is formed for receiving the workpiece (part 45 in Figure 4) and a bracket 40. On the side facing the transport band 110 there is furthermore provided on the bracket 40 an optical scanning element 41 (sensor).

The device 100' according to Figure 2 comprises substantially a base plate 10', a sliding plate 15', a support element 20' with bracket 40' and scanning element 41', a first drive 25' for feed motion directed in the X direction and a second drive 30' for feed motion directed in the Y direction. Deviating from the device 100 according to Figure 1, in the device 100' there is provided a further third drive 31 arranged corresponding to the first drive 25' instead of the guide device 50. Furthermore in Figure 2 measuring elements 42, 43 and 44 associated with the drives 25' and 30' and 31 can be seen, which measuring elements are formed and correspondingly arranged for a measurement of spacing as well as for a measurement of parallelism and for control.

The device 100'' according to Figure 3 comprises substantially a base plate 10'', a sliding plate 15'', a support element 20'' with bracket 40'' and scanning element 41''. Deviating from Figure 1 and Figure 2 two diagrammatically represented direct current linear motors 32, 32'', known per se, are provided in this exemplary embodiment, which in each

case are operatively connected to the corresponding support element by way of a correspondingly formed guide device 35 and 35' for the actual feed motion of the support element 20''. The individual guide device
5 35 or 35' has a T-shaped slide part 38 formed from a flange 36 and a web 37 and is arranged with the web 37 between two guide parts 39, 39'. The flange 36 is provided for the operative connection to the support
10 20'', with an air bearing 3 which can be vacuum-biased (Figure 8), whilst the web is arranged and mounted between the two guides 39, 39' by means of a so-called counter pressure bearing 4 (Figure 6). Furthermore corresponding measuring elements 33, 34 are associated
15 with the two guide devices 35, 35'.

In the above-described exemplary embodiments of the device 100, 100' and 100'', according to Figures 1, 2 and 3, the respective support element 20, 20' and 20'' is mounted in a freely moveable manner in the
20 plane in the X direction and/or Y direction, ensured against vertical forces on the sliding plate 15, 15' and 15'', by means of an air cushion bearing 1 which can be vacuum-biased. In an exemplary embodiment not shown the air cushion bearing 1, can also be formed, as
25 a so-called magnetisable suspended bearing, while maintaining the same operating conditions.

Figure 4 shows as a preferred exemplary embodiment the device 100 represented in enlarged scale and in perspective view, and the base plate 10, the
30 sliding plate 15, the support element 20 with the bracket 40, the two drives 25 and 30 as well as the guide device 50 can be seen.

The base plate 10 has an absolutely level assembly surface 11, which is provided as a bearing and
35 fastening surface for the two drives 25, 30 as well as for the sliding plate 15 and is correspondingly formed.

The sliding plate 15 is secured to the base plate 10 with means not shown in any more detail and is provided on the side facing the support element 20 and the guide device 50 with a plane sliding surface 16.

5 In order to form a so-called air bearing the sliding surface 16 has a correspondingly formed and preferably ground surface structure. The base plate 10 as well as the sliding plate 15 can also be formed as a component in one piece, while maintaining the corresponding
10 bearing, fastening and sliding surfaces.

The support element 20 is preferably formed as a box-shaped hollow body with a recess 46 for receiving and fastening the workpiece 45, for example for receiving a gripping element 45, formed in
15 accordance with semi-conductor technology. On the lower side of the support element 20, denoted by 21, there is arranged an air bearing 1, able to be vacuum-biassed, for compensating for forces acting vertically on the support element 20.

20 Figure 5 shows, according to the direction of the arrow V in Figure 4, the air bearing 1 arranged on the lower side 21 of the support element 20 and a vacuum zone 22 formed as a depression or recess can be seen, which is surrounded completely on the periphery
25 by a pressure air zone 23 provided with bores 23' or the like, arranged spaced relative to each other.

The guide device 50 comprises a guide part 51 as well as a slide part 60. The guide part 51 formed in profile cross-section in a U-shape has two webs 53,
30 54 arranged in parallel relative to each other and connected to each other by means of a flange 52. The guide part 51 is arranged with the two webs 53, 54 on the sliding surface 16 of the sliding plate 15 and is secured in a detachable manner by fastening means not
35 represented in more detail. The two inner sides 53' and 54' of the webs 53, 54 facing the slide part 60,

are formed as counter pressure bearings 4.

Figure 6 shows in section following the line VI-VI in Figure 4 as an exemplary embodiment, the guide part 51 with the counter pressure bearing 4 arranged on the one inner side 53' and two pressure air zones 55, 55', arranged spaced relative to each other, and separated by a depression or a recess 57, said zones being provided with bores 56, 56' arranged spaced relative to each other.

10 The slide plate 60 formed substantially in a square shape, on the one hand, is provided with an air bearing 3 on the end side 61 facing the side wall 24 of the support element 20 and, on the other hand, with an air bearing 2 on the lower side 65 facing the sliding surface 16 of the sliding plate 15.

Figure 7 shows, following the direction of arrow VII in Figure 4, the air bearing 2, arranged on the lower side 65 of the slide part 60 and two pressure air zones 67, 67' arranged spaced relative to each other by a recess or depression 68, in which in each case there is arranged a vacuum zone 66, 66' formed as a recess or a depression. In the individual pressure air zones 67, 67' there are provided bores 69, 69' arranged correspondingly spaced relative to each other.

25 Figure 8 shows, following the direction of arrow VIII in Figure 4, the air bearing 3 arranged on the end side 61 of the slide part 60 and a vacuum zone 62 formed as a recess or depression can be seen as well as a pressure air zone 63, 63', surrounding the vacuum zone 62, with bores 64, 64' arranged spaced relative to each other.

At this point it should be pointed out that the air bearing 1 arranged on the lower side 21 of the support element 20 (Figure 5) and the air bearing 2 arranged on the lower side 65 of the slide part 60 (Figure 7), as well as the air bearing 3 arranged on

the end side 61 of the slide part 60 (Figure 8), is formed in each case as an air bearing, able to be vacuum-biassed, whilst the air bearing 4 (Figure 6) associated with the two side surfaces 60', 60'' of the slide part 60 and arranged on the inner sides 53', 54' of the webs 53, 54 is preferably formed as a so-called counter pressure bearing. The individual air bearings 1, 2, 3 and 4 are operatively connected to a corresponding energy source for generating the vacuum mentioned or for the compressed air supply by way of a channel system not represented any further and arranged in the individual elements.

The two electric-motor drives 25 and 30, according to Figure 4, are identical to one another in their construction as well as in their functioning. At this point only the essential elements of one drive 25 will be described:

The drive 25 comprises a stator body 28 provided with magnets (not shown), a coil body 27 arranged in correspondingly formed slits 29 (only one slit represented) of the stator body 28, said coil body being arranged on one support member 26.

The stator body 28 has at least two slits 29 arranged in parallel spacing relative to each other and is arranged, preferably secured in a detachable manner, on the surface 11 of the base plate 10 with means not represented further.

The support member 26 is formed for receiving the coil body 27 and is secured in a detachable manner to the support element 20 with means not represented further. In order to receive a coil body, not shown, for the drive 30, a further support member 26' is provided on the support element 20. The individual elements of the drive 30, not shown in any more detail, are identical to the elements 27, 28 and 29 of the drive 25.

The individual parts of the electric-motor drives 25 and 30 according to Figure 1 and Figure 4 as well as the parts 25', 30', 31 according to Figure 2 are formed in such a manner and arranged relative to each other that with corresponding direct-current or direct-current pulse excitation of the coil body 27 a horizontal lifting movement of the parts 27, 26 and 20, operatively connected to one another, relative to the stator body 28 is produced in the X direction and/or Y direction. Because of the special formation and arrangement of the parts 26 and 27 in the slits 29 of the stator body 28 in addition to the substantially linear movement in the X direction or Y direction, a movement can be produced directed approximately transverse thereto, that is approximately parallel to the course path of the coil body 27. This so-called flexible transverse movement is dependent on the inner dimensions of the parts 26, 27 formed for example in the shape of a box, relative to the outer dimensions of the central flange of the stator body 28, not shown or represented any further, surrounded completely on the periphery by the parts 26, 27. In the exemplary embodiment of the electric-motor drive 25 shown in Figure 4 the support member 26 for the coil body 27 is rigidly connected to the support element 20 and forms a suspended component which is freely movable extensively in the horizontal plane relative to the fixed stator body 28. The support member 26 is arranged here on the support element 20 and is secured with means not shown, in such a manner that the magnetic flux acting on the support element 20 extends substantially through the point of gravity of the support element 20. The support element 20 together with the coil body 27 and the support member 26 here are able to moved relative to the fixed stator body 28 in a first direction, which extends with the coil axis (not shown) approximately

coaxially, as well as in a second direction directed approximately at right angles thereto. The electric-motor drive 30 is formed similarly to the drive 25. In a variant not represented of the electric-motor drives
5 there is also the possibility, however, of forming the stator body 28 and the support element 20 or 20' as a component and to form and arrange the support member 26 with the coil body 27 in a fixed manner. In this case the support element 20, 20' together with the stator
10 body is able to be moved relative to a support member for the coil body, arranged in a fixed manner, into a first direction extending approximately coaxially to the coil axis, as well as into a second direction directed at right angles thereto.

15 At this point it should be noted that the drives 25, 25' as well as drives 30, 30' and 31 represented in Figures 1, 2 and 4 in a diagrammatic manner are neither the subject matter of this invention in their special construction nor in their mode of
20 operation and are therefore not be described in further detail here.

Figure 9 shows a diagrammatically represented variant of a guide device 150 for the device 100 represented in Figure 1 and the base plate 10 with the
25 sliding plate 15 arranged thereon as well as the support element 20, able to be adjusted on the sliding plate in the X direction and/or Y direction and operatively connected to the drives, not represented here, can also be seen. The support element 20 is
30 likewise arranged in a freely moveable and adjustable manner on the sliding plate 15, by means of the air bearing 1, not represented in Figure 5, and which is able to be vacuum-biassed. The guide device 150 comprises a slide part 160 formed with a flange 161 and
35 a web 162, arranged approximately transverse thereto, which part is T-shaped in cross-section and is guided

with the web 162 on a beam-like formed guide part 151. The guide part 151 is secured in a detachable manner with means, which are not represented, on the surface of the sliding plate 15. The flange surface 161'

5 facing the support element 20 and directed in a vertical manner as well as the guide surface 151' facing the web 162 and directed vertically are provided in each case with an air bearing 3 able to be vacuum-biassed, such as represented, for example, in Figure 8.

10 Figure 10 shows, represented diagrammatically, a further variant of a guide device, denoted by 251, for the support element 20 of the device 100 according to Figure 1 and one can see the base plate 10, the sliding plate 15 as well as the
15 support element 20 for the bond head, not represented here, adjustable in a vacuum-biassed manner on the sliding plate 15, against vertical forces by means of the air bearing 1 represented in Figure 5. The guide device 250 comprises a slide part 260 formed from a
20 beam-shaped flange 261 and a plate-like web 262, formed substantially in two parts. The web 262 is operatively connected to the flange 261 by means of a sheet-metal strip 263, integrated on the parts 261 and 262 acting in a spring-elastic manner. The slide part 260 is, as
25 represented in Figure 11 in section following line XI-XI in Figure 10, held in two guide parts 251, 251', arranged laterally on the sliding plate 15, and arranged with a small clearance 264 spaced relative to the sliding plate 15. The vertical flange surface 261'
30 facing the support element 20 is provided with an air bearing 3 which can be vacuum-biassed, such as shown for example in Figure 8. Between the two guide parts 251, 251' and the web 262 one profile body is provided in each case as a connecting element, in the example
35 represented this is a cylindrical profile body 252, 252', wherein the parts 251, 251' as well as the web

262 is provided with recesses formed corresponding to the profile body. Between the outer surface of the individual profile body 252, 252' and the recess in the web 262 of the slide part 260 there is provided in each
5 case an air bearing 265, 265' not shown in more detail.

In order to detect the temporary position of the support element 20, 20' or 20'' and for corresponding control or activation of the associated electric-motor drives 25, 30 or 25', 30', 31 or 32, 32'
10 there are provided and arranged on the devices 100, 100' or 100'' correspondingly formed measuring elements, by means of which in dependence on a result, for example a comparison result, the respective drive acting in the X direction or Y direction is activated,
15 for example by a direct current excitation pulse.

In the preferred exemplary embodiment of the device 100 according to Figure 1 or according to Figure 4 there are arranged in the support element 20, as shown diagrammatically in Figure 12, on the lower side
20 21 facing the sliding plate 15 in a correspondingly formed recess 18, two measuring elements 72, 73 which are fastened in a detachable manner with means not represented in more detail. In a recess 17 of the sliding plate 15 there are arranged two measuring heads
25 70 and 71 associated with the measuring elements 72, 73 and fastened with means not represented. The individual elements 70 to 75 form together an optronic measuring device 80. For example so-called glass measuring bars can be provided as measuring elements
30 72, 73, one of which is provided with strip units directed in the X direction and the other with strip units directed in the Y direction. A plate or the like formed in one piece and equipped with strip units in the X direction and Y direction can be incorporated as
35 a measuring element into the recess 18 or arranged at a suitable point on the support element 20. By means of

the measuring heads 70, 71 working preferably in an
optronic manner, data which is dependent with regard to
position on the measuring elements 72, 73, arranged on
the support element 20, are determined and converted
5 into signals, which are supplied by means of lines 74,
75, for example to the electric-motor drives 25, 30, or
even a control device (not shown) correspondingly
activating the drives 25, 30.



Claims

1. A device for carrying out feed motion of a workpiece, in particular a bond head formed as a gripper, towards a work station, with a support element
5 (20, 20', 20'') arranged on a sliding plate (15, 15', 15'') or the like and formed for receiving the workpiece, which element is operatively connected to at least two drives (25, 30), for example to electric motor drives and is able to be adjusted relative to the
10 sliding plate (15, 15', 15'') along two coordinates directed in the X direction and Y direction in the plane approximately at right angles relative to each other, wherein the support element (20, 20', 20'') is operatively connected substantially to the moving part
15 of the electric motor drive, and by means of a sliding bearing associated with the sliding plate (15, 15', 15''), is able to be moved in the predetermined horizontal plane with translational and rotational degrees of freedom and extensively freely suspended on
20 the sliding plate (15, 15', 15'') and is arranged in a vacuum-biassed manner on the sliding plate (15, 15', 15'') by means of at least one air cushion bearing (1) arranged on the lower side (21) facing the sliding plate (15, 15', 15'') and formed for example from a
25 vacuum zone (22) as well as a pressure air zone (23) surrounding the vacuum zone (22).

2. A device according to claim 1, characterised in that the support element (20, 20', 20'') is arranged by means of at least one suspended
30 bearing provided on the lower side (21) facing the sliding plate (15, 15', 15'') and formed so that it is magnetisable.

3. A device according to claim 1 or 2, characterised in that the support element (20) is
35 operatively connected to a first drive (25) for the movement directed in the Y direction, to a second drive



(30) for the movement directed in the X direction and on the side opposing the first drive (25) is operatively connected to a guide device (50, 150, 250) as well as to an optronic measuring device (80)
5 correspondingly associated with the support element (20), wherein the measuring device (80) is formed to detect the movement of the support element (20), directed relative to the sliding plate (15) in the X direction and/or the Y direction, as well as to
10 activate a control of the two drives (25, 30) (Figures 1, 12).

4. A device according to claim 1, characterised in that associated with the support element (20') for the movement directed in the X
15 direction there are two drives (25' and 31) arranged correspondingly relative to each other and, for the movement directed in the Y direction, one drive (30') and in that for detecting the movement directed in the X direction and/or the Y direction and for parallel
20 measurement as well as for activation of a control of the drives (25', 30' and 31) there are provided correspondingly formed measuring elements (42, 43, 44) operatively connected thereto (Figure 2).

5. A device according to claim 1,
25 characterised in that
a) there is provided in each case for the movement directed in the X direction and the Y direction a direct current-linear motor (32, 32'), known per se, operatively connected to the support
30 element (20'') by way of a guide device (35, 35'),
b) the guide device (35, 35') comprises in each case a slide part (38) formed in a T-shape and guided between two guide parts (39, 39'),
c) the slide part (38) with the web (37) is
35 guided linearly between the guide parts (39, 39'), by means of an air bearing (4) formed as a counter



pressure bearing, and, with the flange (36), is
operatively connected to the support element
(20'') by means of a vacuum-biassed air bearing
(3) arranged orthogonally to the sliding plate
5 (15''), and

d) correspondingly formed measuring elements
(33, 34) are associated with the guide devices
(35, 35') for detecting the movement directed in
the X direction and the Y direction, as well as
10 for activating the control of the two direct
current-linear motors (32, 32') (Figure 3).

6. A device according to claim 3,
characterised in that the guide device (50) comprises
substantially a guide part (51) and a slide part (60),
15 and in that the slide part (60), on the one hand, is
operatively connected to the support element (20) on
one end side (61) with an air bearing (3), which can be
vacuumed-biassed and which is arranged orthogonally to
the slide part (15), and, on the other hand, is
20 operatively connected to the sliding plate (15), with
an air bearing (2), which can be vacuum-biassed and
which is arranged parallel to the sliding plate (15)
(Figure 4).

7. A device according to claim 6,
25 characterised in that the guide part (51) has two webs
(53, 54) arranged in parallel spacing relative to each
other and at right angles to the sliding plate (15),
between which webs the slide part (60) is guided in a
displaceable manner in the Y direction by means of an
30 air bearing (4) formed as a counter pressure bearing
(Figure 4).

8. A device according to claim 7,
characterised in that the guide part (51) formed from
the webs (53, 54) and a flange (52) connecting the webs
35 to each other, is formed in profile cross-section in a
U-shape and, on the inner sides (53', 54') of the webs



(53, 54), is provided with the counter pressure bearing (4) acting against two side faces (60', 60'') of the slide part (60) (Figure 4).

9. A device according to claim 1, 3 or 4,
5 characterised in that the electric motor drives (25, 30, 25'; 30', 31 or 32, 32') are formed as electric direct current-linear drives or direct current-pulse linear drives.

10. A device according to claim 1 and 9,
10 characterised by the use of electric motor drives (25, 30), in which the stator body (28) has an E-shaped profile cross-section, known per se, with flanges arranged spaced relative to each other and provided on the inner sides with magnetic bodies, and in that the
15 coil body (27) freely movable in the plane in corresponding recesses (29) between the flanges and operatively connected to the support member (26), is activated with corresponding direct current excitation such that the coil body (27) embracing the central
20 flange, provided as a pole, and formed in a box-frame shape is able to be moved together with the support member (26) into a first direction directed corresponding to the axis of the coil body (27) as well as into a second direction directed substantially
25 transverse thereto.

11. A device according to claim 1, 3 or 4,
characterised in that the element of the electric motor drive (25, 30; 25', 30', 31 or 32, 32'), moved by a corresponding electric direct current excitation or
30 direct current pulse excitation, is formed with the support element (20; 20' or 20'') as a constructional unit, in which unit the direction of the flux of force of the moved drive element occurs substantially through the centre of gravity of the support element (20, 20',
35 20'').

12. A device according to one of claims 1, 3



or 4, characterised in that

- 5 a) each drive (25, 30, 31) comprises a stator body (28) arranged in a fixed manner on a base plate (10), and provided with two slits (29), arranged horizontally in parallel spacing relative to each other, as well as a support member (26, 26') arranged on the support element (20), provided for receiving a coil body (27) operatively connected to the stator body (28), and
- 10 b) the coil body (27) with the support member (26, 26'), with corresponding direct current excitation of the coil body (27) is able to be moved relative to the stator body (28) in a first direction (X) and/or at right angles thereto in a
- 15 second direction (Y).

13. A device according to claim 10 and 11, characterised in that the support element (20 or 20') is formed with the support member (26 or 26') and the respective coil body as a rigid constructional unit.

20 14. A device according to claim 3 and 6 to 12, characterised through the combination of the following features:

- a) the support element (20) operatively connected to the electric motor drives (25, 30) is
- 25 arranged freely mobile on the sliding plate (15), by means of the air bearing (1) which can be vacuum-biassed and arranged parallel to the sliding plate (15),
- b) the support element (20) is guided with the
- 30 one side wall (24) by means of the air bearing (3) which can be vacuum-biassed and which is arranged orthogonally to the sliding plate (15), on the end side (61) of the slide part (60), in a displaceable manner in the X direction,
- 35 c) the slide part (60) is guided by means of the air bearing (2) which can be vacuum-biassed and



which is arranged parallel to the sliding plate (15) on the sliding plate (15) as well as by means of the counter pressure air bearing (4) between the two webs (53, 54) of the guide part (51) in a
5 displaceable manner in the Y direction, and
d) the optronic measuring device (80) operatively connected to the support element (20) is formed to detect movement of the support element (20) directed in the Y direction and/or Y
10 direction (sic), as well as for activating the control of the corresponding drive (25, 30) (Figure 4).

15 15. A device according to claim 3, characterised in that the optronic measuring device (80) comprises
a) at least one measuring element (72, 72) operatively connected to the support element (20) and provided with strip units directed in the X direction and the Y direction and
20 b) on the side facing the measuring element (72, 73) at least one optronic measuring head (70, 71) arranged relative to the measuring element (72, 73) in a fixed manner on the sliding plate (15) and in that
25 c) from the measuring head (70, 71) an activation of the control of drives (25, 30), dependant upon the position occurs relative to the support element (20).

30 16. A device according to claim 14, characterised in that the plate-like measuring element (72, 73) is arranged in a recess (18) of the support element (20) facing the surface (16) (of) the sliding plate (15) and the measuring head (70, 71) is arranged in a recess (17) of the sliding plate (15) facing the
35 support element (20).

17. A device according to claim 3,



characterised in that the guide device (150) comprises a slide part (160), guided in a linear manner on a guide part (151), firmly connected to the sliding plate (15), and formed in a T-shape, which slide part

5 a) together with the flange (161) is operatively connected to the support element (20) by means of the air bearing (3) which can be vacuum-biassed, and

10 b) together with the web (162) is operatively connected to the sliding plate (15) and the guide part (151) by means of an air bearing (3) which can be vacuum-biassed (Figure 9).

18. A device according to claim 3, characterised in that the guide device (250) comprises
15 an approximately T-shaped slide part (260), supported between two guide parts (251, 251') arranged spaced relative to each other on the sliding plate (15), which slide part

20 a) is arranged with the flange (261) by means of the air bearing (3) which can be vacuum-biassed, with the support element (20) and

b) with the web (262) in the horizontal plane and spaced (264) relative to the sliding plate (15) between two guide parts (251, 251') and by
25 means of two profile body-coupling elements (252, 252') arranged in correspondingly formed recesses, wherein

c) in the recesses of the web (252) in each case there is provided a counter pressure air bearing
30 (265, 265') acting on the corresponding coupling element (252, 252').

19. A device according to one of claims 1, 3 or 4, characterised by the use of electric motor drives (25, 30 or 25', 30', 31), in which application the
35 support element (20, 20') is able to be moved together with the coil body (27) and the support member (26),



relative to the stator body (28), arranged in a fixed manner, in a first direction extending approximately equally with the coil axis as well as into a second direction directed at right angles thereto.

- 5 20. A device according to one of claims 1, 3
or 4, characterised by the application of electric
motor drives, in which application the support element
(20, 20') together with the corresponding stator body
is able to be moved relative to a support element,
10 arranged in a fixed manner, for the coil body, in a
first direction extending approximately in the same
direction as the coil axis, as well as in a second
direction directed at right angles thereto.