

Drive Apparatus for a Slidable Divider Element, Drive Assembly and Divider Element

The invention relates to an apparatus for driving slidable, specifically, rotatable divider elements, as well as to a
5 drive assembly for the drive apparatus, and a divider element driven by the drive apparatus as specified in the preamble of Claims 1, 10, or 11.

Glass or wooden walls, sliding panels, doors, or shutters – hereafter called divider elements – which are immovably
10 mounted or attached so as to move on drive assemblies slidable along a rail, and are optionally rotatably mounted and/or stackable or parkable – are often employed to separate or configure rooms, or to close off room or window openings.

Reference [1], WO 2004/005656, discloses the drive apparatus,
15 illustrated below in Figure 1 which serves to drive an optionally rotatable or parkable divider element 3 which is slidable linearly and/or in curves, and which is attached to at least two drive assemblies 2000, 2001 moving on a rail 100 and provided with running wheels 211, the first of these drive
20 assemblies 2000 being provided with an electric motor 43 located between the running wheels. The vertical drive shaft of electric motor 43 is connected to a gearing 44 which is connected by flanges 61, 62 to a connector shaft 63 which in turn drives a toothed gear 91 engaging a toothed belt 51.
25 Connector shaft 63 is rotatably supported at its upper end by a first flange 62 in the housing of drive assembly 2000 and at its lower end by a second flange 64 within a coupling piece 33. The solution disclosed in [1] provides a very compact design for the drive assembly provided with the drive motor
30 and gearing.

The disadvantage of this solution, on the other hand, is the fact that a high degree of interdependence between individual

elements of the apparatus results from the compact design, this interdependence having the effect that modifications and further developments of the drive assembly entail considerable expense.

5 Another drive for a sliding door wing guided along a rail and having a compactly designed drive assembly provided with a drive motor is described in [2], EP 1 319 789 A1. The drive motor, which is located on the side facing away from the door wing, that is, above a toothed gear engaging a toothed belt,
10 and the single running wheel are accommodated in the drive assembly that is fixed to the door wing. The drive shaft of the drive motor is provided with a pinion which effectively engages a gear ring which is connected to a center element of the toothed gear, which gear is supported in a rotationally
15 movable manner about its vertical axis of rotation by two bearing rings on a load shaft. The load shaft is supported in a rotationally movable manner about the under-load rotational axis by two spaced bearing rings located above the toothed gear on a drive assembly body of the drive assembly. The
20 under-load rotational axis of the load shaft and the rotational axis of the toothed gear are thus arranged coaxially relative to each other - however, offset relative to the drive shaft of the drive motor. With this drive assembly as well, the arrangement of the load shaft and toothed gear
25 also results in a compact design which, however, means that the toothed gear and the load shaft passing through this gear must be decoupled from each other by bearing rings - again resulting in undesirable interdependencies which figure prominently when examining the arrangement of the drive motor
30 which must be installed very precisely in order to bring about the optimum effective connection between the pinion and the gear ring mounted on the toothed gear. Any changes in the dimensions of the drive assembly body or of the drive motor would most likely result in a relatively high modification
35 expense. In light of the fact that the drive motor already has

the design of a gear motor which is normally supplied by a specialized manufacturer, additional gearing elements to be installed in the apparatus by the user of the gear motor should be avoided. This is true especially in light of the
5 fact that additional gearing elements result in relatively high fabrication, assembly and maintenance costs. This last fact is especially relevant since the pinion and gear ring are not integrated in a gearing unit so as to be protected, and the quality standard for the gearing manufacturer is
10 essentially unattainable.

The goal of this invention is therefore to create an improved drive apparatus specifically for divider elements which are slidable linearly or in curves, and are optionally rotatable or parkable. A drive assembly provided with this drive
15 apparatus is also presented.

Specifically, the goal is to create a cost-effectively designed drive assembly of small dimensions in the which the apparatus's components have a reduced interdependence, thus enabling modifications and further developments of the drive
20 assembly to be implemented simply, rapidly, and in a cost-effective manner.

In addition, the goal is to avoid decoupling or coupling elements which move or which contact moving parts, specifically, bearing or gearing elements provided by the user
25 which result in an increase in fabrication or maintenance costs.

An additional goal is that the drive assembly according to the invention has further-improved travel characteristics, specifically, including during travel in tight curves, and
30 ensure reliable coupling between the provided toothed gear and the toothed belt located in within the rail.

This goal is achieved by a drive apparatus, a drive assembly, and divider element which have the features indicated in Claims 1, 10, and/or 11. Advantageous embodiments of the invention are indicated in additional claims.

5 The apparatus which serves to drive a divider element which is slidable linearly and/or in curves, and is optionally rotatable or parkable, comprises a drive assembly

a) which is guided by two running wheels on the running surface of a rail;

10 b) which has a drive shaft driven by an electric motor and a gearing, this shaft being coupled by a toothed gear to a toothed element, preferably a toothed belt, connected to the rail, and;

15 c) which is connectable through a load shaft to the divider element.

According to the invention, the drive assembly has a traveling assembly unit with a drive assembly body in which the load shaft emerging from the bottom side of the drive assembly body and two parallel shafts emerging in one plane vertically thereto from a first side of the drive assembly body are retained, and which drive assembly body has on its top side a head piece which is detachably connected to a drive unit in which the electric motor and gearing are arranged such that the drive shaft running parallel or in fact coaxially relative to the load shaft emerges upward from the drive unit so as to enable the toothed gear mounted on the drive shaft to engage the toothed belt retained above the running surface of the rail.

30 The solution according to the invention thus provides a clear spatial separation of drive assembly functions and a simple interface between the traveling assembly unit and drive unit whose apparatus components are completely decoupled from each

other, apart from the required mechanical, preferably articulated, connection between the traveling assembly unit and drive unit. Here the load shaft and drive shaft, or the drive gear or toothed gear engaging the toothed belt, are
5 completely decoupled from each other - thereby eliminating the need for any decoupling elements. The toothed gear is driven directly by the electric motor and attached gearing, preferably, a gear motor, forming a unit without any intermediate coupling by gearing elements. The result is thus
10 a simple design for the drive assembly, reduced production cost, and minimum maintenance costs. An especially advantageous aspect is the fact that given the common interface and interconnection both the drive unit and traveling assembly unit are able to be further developed and
15 maintained. It is thus possible at minimum development expense to replace the gear motor by a model of different dimensions, as long as the interior dimensions of the rail allow this. In addition, the manufacturer of the drive apparatus can thus procure the entire drive unit with corresponding quality
20 specifications from one motor and gearing manufacturer who does not have to be responsible for issues relating to the drive assembly's engineering.

In an especially advantageous manner, the head piece of the traveling assembly unit, in which recesses for the partial
25 accommodation of the running wheels can be provided, forms the base of the housing for the drive unit. As a result, the overall dimensions of these two interconnected units are further reduced - as is the expense for assembly and maintenance.

30 On the top side of the drive unit, preferably a guide unit is immovably or, preferably, detachably mounted - the guide unit optionally providing additional support for the drive shaft, for which purpose it is provided with a bearing element - which guide unit supports by means of shafts, the axes

of which run parallel to the axis of the load shaft, one or two top guide elements, guide wheels or sliding elements spaced as closely as possible together and running in a top guide channel of the rail. At its top side, the drive assembly
5 is guided by the top guide element(s) along a line or curve running parallel to the toothed belt, thereby always ensuring proper engagement of the toothed gear in the toothed belt. By using two top guide elements, any torques acting on the drive assembly, specifically, that caused by the drive unit, are
10 compensated, and directional changes within the rail path are intercepted, thereby ensuring stable guidance for the drive assembly. In the event two top guide elements are used, the intervening vertical axis of the drive shaft, however, follows a line which in curved paths always exhibits greater distances
15 relative to the toothed belt. These deviations from the minimum distance present in the case of straight rail sections change the engagement of the toothed gear in the toothed belt and are kept as small as possible – for example, by locating the top guide elements, or their axes, as close together as
20 possible. However, this has the result that greater forces act on the top guide elements and that the drive assembly is not always guided with the same precision. For certain load or operating conditions, it may therefore be advantageous to provide bottom guide elements on the traveling assembly unit –
25 or even a support element, support wheel, or sliding element. For example, two somewhat more widely spaced bottom guide elements can be provided which stabilize the drive assembly, while only one top guide element is used which ensures optimal engagement of the toothed gear in the toothed belt. To provide
30 further decoupling of the traveling assembly unit and drive unit, these preferably have an articulated connection such that the drive unit along with the toothed gear can incline towards the toothed belt without the corresponding torques being transferred to the traveling assembly unit, or

corresponding force effects on the guide elements being created (see Figure 11).

The body of the traveling assembly, the housing of the drive unit, and the body of the guide unit are preferably able to be
5 connected in a form-locking manner by flange elements, and are able to be screwed immovably together by at least one mounting screw passing completely through the housing of the drive unit. This aspect allows the three units mentioned to be quickly and stably connected in the simplest manner possible.

10 The load shaft is preferably a screw, the shaft of which is passed through a hole in a central component of the body of the traveling unit, and the head of which is retained in a correspondingly enlarged hole, projecting at least into the head piece of the traveling unit body, which hole is able to
15 be closed by a securing element. The load shaft is thus able to be passed through the traveling assembly body until the screw head is retained preferably rotatably within the enlarged hole. The load shaft is thus retained directly adjoining the drive unit, practically within one housing
20 component of this unit, and directed downward by the central component of the body of the traveling assembly. On both sides of the load shaft, the two shafts for the running wheels situated under the head piece on one side of the central component are retained in holes of the central component. It
25 is thus possible to fabricate the body of the traveling assembly unit in a minimized size which nevertheless allows the described traveling assembly functions to be performed optimally, and also to serve as the basis for mounting the power transmission and control device.

On the bottom of the traveling assembly unit, a contacting module is preferably provided which contacts a two-wire electrical line for the power supply, this electrical line being located in a channel of the rail below the running surface for the running wheels.

A control module is mounted, preferably, on the shafts of the running wheels, on the second side of the traveling assembly unit opposite the running wheels, above the running surface for the running wheels.

The spatial conditions within the rail and the opportunities for installation provided by the body of the traveling assembly unit are thus combined and utilized in an optimal manner. A preferably tapered part of the central component along with the load shaft provided therein passes through the narrowing which is formed by rail elements provided on the two rail walls, the running surfaces being provided on the top sides of the rail elements. A channel is preferably integrated, at least in this part of the central component, which allows electrical power lines to pass downward through the narrowing to the control module or control lines by which, for example, control signals are transmitted to a closing device of the divider element.

The bottom of the above-mentioned rail element with the running surface preferably has an inner connecting channel capable of accommodating a connecting peg which is, or the opening of which is, preferably inclined inward, for example, by 30° , such that this peg, or screw elements provided in the connecting peg, are easily accessible with a tool introduced through the bottom opening in the rail. At the same time, the inclination of the inner connecting channel, or the differently inclined inner connecting channels of the two rail sides achieves the result that the two rail pieces are now aligned in multiple directions relative to each other and can be connected more precisely.

The two-wire electrical line inserted in the rail channel preferably comprises a plastic ribbon on which the electrical lines are provided and which is provided on both sides with elastic collars which lock into retaining strips provided on the edges of the rail channel. The two-wire electrical line can thus be pressed into the rail channel, the elastic collars being pressed together and locking in under the retaining strips, thereby securing the two-wire electrical line. As a result, installation can be performed quickly and does not require any additional means such as screws or adhesives.

The contacting module has elastically retained contact pins, preferably supported by spring elements, which are connected to a circuit board screwed onto the contacting module. The contacting module can thus be assembled and installed very easily.

The following discussion explains the invention in more detail based on the drawings.

Figure 1 shows the drive apparatus disclosed in [1] for a slidable and rotatable divider element 3;

Figure 2 shows a drive apparatus according to the invention comprising a drive assembly 2 guided within a rail 1, which drive assembly is composed of a traveling assembly unit 21, a drive unit 22, and a guide unit 23;

Figure 3 is a three-dimensional view of the rail 1 of Figure 2 which has two lateral components 1a, 1b, which are joined by a center component 1c;

Figure 4 is a sectional view of drive assembly 2 of Figure 2;

Figure 5 is a sectional view of the guide unit 23 of Figure 4 after disassembly;

5 Figure 6 is a sectional view of drive unit 22 of Figure 4 after disassembly;

Figure 7 shows traveling assembly unit 21 of Figure 4 after disassembly together with a section through the holes 2141, 2142 provided to accommodate the load shaft 7;

10 Figure 8 shows drive assembly 2 of Figure 2 with various lines of intersection S1,... , S4, additionally provided with a support wheel 2150;

Figure 9 shows drive assembly 2 of Figure 8 as seen from below;

15 Figure 10 shows drive assembly 2 of Figure 8 as seen from above;

Figure 11 is a side view of the modified drive assembly 2 of Figure 8 with a profiled component 31 of divider element 3;

20 Figure 12 shows drive assembly 2 of Figure 8 in cross-section along intersection line S1 with exposed toothed gear 91 which engages the toothed belt 51;

25 Figure 13 shows drive assembly 2 of Figure 8 in cross-section along intersection line S2 with exposed drive motor 43;

Figure 14 shows drive assembly 2 of Figure 8 in cross-section along intersection line S3 with a cutaway view of running wheels 211 and their shafts 212;

Figure 15 shows drive assembly 2 of Figure 8 in cross-section along intersection line S4 with a cutaway view of contacting unit 41;

5 Figure 16 shows left rail component 1a with running wheels 211, a support wheel 2150, as well as top and bottom guide elements 231, 215;

Figure 16a shows the distance between toothed gear 91 and rail side 1 during travel through a curve K2 when using two top guide elements 231;

10 Figure 16b shows the distance between toothed gear 91 and rail side 1 during travel through a curve K2 when using only one top guide element 231;

15 Figure 16c shows the distance between toothed gear 91 and rail side 1 during travel through a curve K2 when using only one top guide element 231 and two bottom guide elements 215;

20 Figure 17 shows drive assembly 2 guided within rail 1 with a top and bottom guide channel 14, 15, in which one top guide element 231 and two bottom guide elements 215 are guided; and

Figure 18 shows traveling assembly unit 21 of Figure 4 after disassembly, with a section through the holes 2143 provided to accommodate a running wheel shaft 212.

25 Figure 1 shows the drive apparatus [1] disclosed as referenced below which was described in the introduction.

30 Figure 2 shows, in a first embodiment, a rail 1 according to the invention, comprising a center component 1c which interconnects two side components 1a, 1b, and which for this purpose is anchored in corresponding channels 15 which run along the top sides of side components 1a, 1b.

Figure 3 is a three-dimensional view of three-part rail 1 in Figure 2.

Each of side components 1a, 1b has at the bottom a electrical line channel 11 open towards drive assembly 2 which serves to
5 accommodate two-wire electrical line 52 (see Figures 4 and 15), at the extreme ends of which channel retaining strips 111, 112 are provided which serve to hold the inserted two-wire electrical line 52. Two-wire electrical line 52 comprises a plastic ribbon 522 on which electrical lines 521 are
10 provided and which is provided on both sides with elastic collars 5221 that lock in after two-wire electrical line 52 is inserted against retaining strips 111, 112.

A rail element 120 is provided above electrical line channel 11, on the top side of which a running surface 12 is provided
15 for running wheels 211 of drive assembly 2. On its bottom side, rail element 120 also has an inner connecting channel 17, which is inclined inward, capable of accommodating connecting peg 170. An outer connecting channel 18 is provided on the exterior of side components 1a, 1b, to accommodate
20 connection peg 170. Connection pegs 170 are inserted into corresponding connecting channels 17, 18 by two end-face-abutting rail components 1 and are retained, for example, by screws the are provided on the front with cup points.

A drive guide channel 13 opening towards drive assembly 2 is
25 provided above rail element 120 to accommodate toothed belt 51, while above this a top guide channel 14 opening downward is provided to receive top guide elements 231.

Drive assembly 2 guided within rail 1, or along a rail component 1a – shown in a sectional view in Figure 4 – has a traveling assembly unit 21, a drive unit 22 located above traveling assembly unit 21, and in this preferred embodiment, a guide unit 23 located above drive unit 22, which components are connected by at least one mounting screw 24.

Traveling assembly unit 21 has a traveling assembly body 210 in which a load shaft 7 emerging outward at the bottom of traveling assembly body 210 and two parallel shafts 212 in a plane perpendicular thereto emerging on a first side from traveling assembly body 210 for running wheels 211 are held, and which traveling assembly body has on its top side a head piece 2101 which is detachably connected to drive unit 22.

An electric motor 43 and a gearing 44, preferably, a gear motor, are located within drive unit 22 such that a drive shaft 9 parallel to load shaft 7 emerges upward out of drive unit 22 so as to enable toothed gear 91 mounted on drive shaft 9 to engage toothed belt 51 held above running surface 12 of rail 1. In order to reduce torques, the preferred approach is to have axes x or y of load shaft 7 and of drive shaft 9 run coaxially, or to have traveling assembly unit 21 and drive unit 22 – as shown in Figure 11 – further decoupled from each other by connecting these in an articulated manner, for example, using a connecting shaft 241, so as to enable drive unit 22 to incline, freely movably or guided by the at least one top guide element 231, towards toothed belt 51. As a result, only those forces or torques are transmitted from drive unit 22 to traveling assembly unit 21 which are in a plane in which connecting shaft 241 and preferably also

divider element 3 are located. In the event traveling assembly 21 and drive unit 22 are, on the other hand, immovably connected, any torques can be intercepted by a support wheel 2150 provided on traveling assembly unit 21 (Figure 11 shows both possible embodiments).

Due to the advantageous functional and essentially mechanical decoupling as a result of the reduction to elementary connecting elements 24, 241, traveling assembly unit 21 and drive unit 22 can be designed independently of each other – an aspect which is especially advantageous. As a result, a commercially available gear motor can be easily employed without the need for additional gearing elements for the transmission of power to toothed gear 91 which is preferably coupled to drive shaft 9 by a spacer sleeve 911 and by a key 912. Due to the level of decoupling achieved, traveling assembly unit 21 can also be designed with minimal dimensions so as to completely fulfill the traveling assembly functions to be performed, the remaining space within rail 1 additionally allowing for the advantageous installation of contacting module 41 for the power supply, and of a control module 42 to control the electric motor.

The separate traveling assembly unit 21 is shown in Figures 7 and 18 in various sectional views. Figure 7 shows that load shaft 7 is a screw, the shaft 71 of which passes through a hole 2142 in a central component 2102 of body 210 of traveling assembly unit 21, and the head 72 of which is retained within a correspondingly enlarged hole 2141 projecting at least into the head piece 2101 of body 210 of traveling assembly unit 21, the hole being closed off by a securing element 8. Traveling assembly body 210 thus functions as a mount for load shaft 7

and in this regard provides an enlarged hole 2141 which is limited at the bottom by an annular flange element lying concentrically over the smaller hole 2142. A ring with rollers is preferably provided on this flange element which serves to support screw head 72. As Figure 18 shows, traveling assembly body 210 has on both sides of enlarged hole 2141 one hole each to accommodate a running wheel shaft 212, the axes of which lie in a plane which is penetrated vertically by axis x of load shaft 7. Running wheel shafts 212 are preferably immovably retained within traveling assembly body 210 such that they can serve to support running wheels 211 on the one side of traveling assembly body 210 (see the ball bearing in Figure 14), and function as a mount for control module 42.

In the embodiment shown, head piece 2101 of traveling assembly body 210, in which recesses 219 are provided for the partial accommodation of running wheels 211, forms the base of the housing 220 of drive unit 22, thereby enabling a smaller overall height to be realized. Figure 18 also shows threaded holes 2145, 2146, which serve to accommodate mounting screw 24 and a screw 416 by which contacting module 41 is mounted on the bottom side of traveling assembly unit 21.

Contacting module 41 has contact pins 411 supported by springs 417, which contact pins are connected to circuit board 413 screwed on to contacting module 41, from which circuit board power supply lines 414 are routed through a channel 2144 provided in traveling assembly body 210 to control module 42 from which control lines 421 are routed, preferably, through a flat cable to electric motor 43. Power supply lines are thus protected by traveling assembly body 210 when passing through the narrowing formed by rail elements 120 which project

towards each other. Control module 42, for example, a printed and component-equipped circuit, is covered by a plate 422 so as to be mechanically and electrically protected.

Figure 6 shows the simply designed drive unit 22 on which
5 guide unit 23 shown in Figure 5 is mounted, which unit has a body 230 into which at least one guide shaft 232 for guide element 231 is inserted, the guide element 231 running within rail 1 along top guide channel 14.

Traveling assembly body 210, housing 220 of drive unit 22, and
10 body 230 of guide unit 23 are able to be connected to each other in a form-locking manner by flange elements 216, 236, and are able to be immovably screwed together by at least one mounting screw 24 passing completely through housing 220 of drive unit 22, and are thus able to be installed and
15 disassembled very quickly.

Figure 8 shows drive assembly 2 of Figure 2 now additionally provided with support wheel 2150 with the various intersection lines S1, ..., S4. Figure 9 shows drive assembly 2 as viewed from below. Figure 10 shows drive assembly 2 of Figure 8 as
20 viewed from above. Figure 11 shows the modified drive assembly 2 of Figure 8 from the side, connected with a profiled component 31 of divider element 3. As described above, any disturbing torques are able to be intercepted by support wheel 2150 provided on traveling assembly body 210. Based on the
25 articulated connection between traveling assembly 21 and drive unit 22 shown in Figure 11, any disturbing force effects and torques can be completely eliminated. The articulated connection can be easily implemented using a connecting shaft 241 which is inserted into corresponding holes within
30 traveling assembly body 210 and housing 220. Traveling assembly 21 and drive unit 22 can thus be separated by removing connecting shaft 241.

Figure 12 shows drive assembly 2 of Figure 8 in cross-section along intersection line S1 with exposed toothed gear 91 which engages toothed belt 51.

Figure 13 shows drive assembly 2 of Figure 8 in cross-section
5 along intersection line S2 with exposed drive motor 43.

Figure 14 shows drive assembly 2 of Figure 8 in cross-section along intersection line S3 with a cutaway view of running wheels 211 and their shafts, as well as elements of a ball bearing.

10 Figure 15 shows drive assembly 2 of Figure 8 in cross-section along intersection line S4 with a cutaway view of contacting unit 41 in which channels 415 are provided for contact pins 411 which are supported by springs 417.

Figure 16 shows rail component 1a in which rail element 120
15 provided with running surface 12 is provided on its bottom side with inner connecting channel 17 and additionally guide channel 16 opening downward, in which channel one or two guide elements 215 connected to traveling assembly body 210 are routed.

20 Figure 16a shows two top guide elements 231 running within a curve K2. Figure 16b shows one top guide element 231 running within curve K2, which guide element together with toothed gear 71 is able to precisely follow the path of the toothed belt. The use of two top guide elements 231 enables any
25 torques acting on the drive assembly, specifically, from drive unit 22, to be compensated and any directional changes in the rail path to be intercepted, thereby allowing drive assembly 2 to be guided in a stable manner. In the event two top guide elements 231 are used, the intervening axis y of drive shaft 9
30 does, however, follow a line which in curved paths takes on increasingly larger distances from toothed belt 51. As the distance between the guide shafts 232 of the top guide elements 231 increases, the distance from toothed gear 91

increases. This distance can therefore be reduced by reducing the relative distance between the guide shafts 232 as much as possible. However, this action results in a situation in which greater forces act on top guide elements 231, and drive
5 assembly 2 is no longer guided with the same precision. For certain load and operating conditions, it may therefore be advantageous to provide two bottom guide elements 215 by which drive assembly 2 is guided in a stable manner. As a result, it is possible to employ a top guide element 231 which ensures
10 the optimum engagement of the toothed gear in the toothed belt. Figure 17 shows a drive assembly 2 designed accordingly with one top guide element 231 and two bottom guide elements 215. The drive assembly 2 shown in Figure 11 can also be designed analogously in which the optimum engagement of
15 toothed gear 91 in toothed belt 51 is always ensured. Figure 17 thus shows both alternatively usable approaches for connecting traveling assembly unit 21 and drive unit 22, that is, the fixed connection using mounting screw 24 and the articulated connection using shaft 241.

20 It is also possible to advantageously implement the solution according to the invention if, in place of running wheels 211 and running surfaces 212, sliding elements to carry divider element 3 are provided which are supported on sliding surfaces of the rail.

Reference literature

- 30
- [1] WO 2004/005656
 - [2] EP 1 319 789 A1

List of reference notations:

	1	rail
	1a,1b,1c	components of rail 1
	11	channel to accommodate two-wire electrical line 52
5	111, 112	retaining strips
	12	running surface for running wheels 211
	120	rail element with running surface 12 and connecting channel 17
	13	channel to accommodate toothed belt 51
10	14	guide channel to accommodate top guide elements
	15	channel to accommodate component 1c of rail 1
	16	guide channel to accommodate bottom guide elements
	17	inner connecting channel
	170	connecting peg
15	18	outer connecting channel
	2	drive assembly with drive motor
	21	traveling assembly of drive assembly 2
	210	body of traveling assembly body 21
	2101	head piece
20	2102	center component
	211	running wheels on traveling assembly unit 21
	212	wheel shaft for running wheels 211
	2141	hole to accommodate screw head 72
	2142	hole to accommodate screw shaft 71
25	2143	hole to accommodate running wheel shaft 212
	2144	channels to route electrical lines
	2145	hole to accommodate mounting screw 24
	2146	hole to accommodate a fastening screw
	215	bottom guide elements on traveling assembly unit 21
30	216	flange element on traveling assembly unit 21

	218	support shaft for bottom guide elements 215
	219	recess in head piece 2101
	2150	support wheel on traveling assembly unit 21
	22	drive unit of drive assembly 2
5	220	housing of drive unit 22
	23	guide unit
	230	body of guide unit
	231	top guide elements on guide unit 23
	232	guide shaft for top guide elements 231
10	236	flange element on guide unit 23
	24	mounting screw
	241	connecting shaft
	3	divider element
	31	mounting profile on divider element 3
15	35	retaining element in mounting profile 31
	41	contacting module
	411	elastically retained contact pins
	412	pressure springs
	413	mounting plate
20	414	power supply lines
	415	channels for spring-loaded contact pins 411
	416	screw to mount contacting module 41
	417	spring elements
	42	control module
25	422	plate, cover
	421	control lines
	43	electric motor
	431	retaining element
	44	gearing
30	51	toothed belt
	52	two-wire electrical line
	521	electrical lines
	522	plastic ribbon
	5221	collar

	7	connecting element or screw held rotatably within traveling assembly unit
	71	shaft of screw 7
	72	head of screw 7
5	8	securing element to close hole 2141
	9	drive shaft of drive unit 22
	91	toothed gear (drive gear)
	911	spacer sleeve
	912	key to connect toothed gear 91
10	913	bearing element

Claims

1. Drive apparatus for a divider element (3) which is
slidable linearly and/or in curves and optionally
5 rotatable and parkable, comprising a drive assembly (2)
which is guided by two running wheels (211) on a running
surface (12) of a rail (1), which drive assembly (2) has
a drive shaft (9) driven by an electric motor (43) and a
gearing (44), the drive shaft (9) being coupled by a
10 toothed gear (91) to a toothed belt (51) connected to the
rail (1), and which drive assembly (2) is connectable by
a load shaft (7) to the divider element (3),
characterized in that the drive assembly (2) has a
traveling assembly unit (21) with a traveling assembly
15 body (210) in which the load shaft (7), emerging from the
bottom of the traveling assembly body (210), and two
parallel wheel shafts (212) for the running wheels (211),
emerging in a plane perpendicular to the load shaft (7)
on a first side from the traveling assembly body (210),
20 are held, and which traveling assembly body (210) has on
its top side a head piece (2101) which is detachably
connected to a drive unit (22) in which the electric
motor (43) and the gearing (44) are arranged such that
the drive shaft (9) running parallel or in fact coaxially
25 relative to the load shaft (7) emerges upward out of the
drive unit (22) so as to enable the toothed gear (91)
mounted on the drive shaft (9) to engage the toothed belt
(51) retained above the running surface (12) of the rail
(1).
- 30 2. Drive apparatus according to Claim 1, **characterized in**
that the head piece (2101) of the traveling assembly unit
(21), in which optionally recesses (219) to partially
accommodate the running wheels (211) are provided, forms
the base of the housing (220) of the drive unit (22) or
35 in that an articulated connection between the traveling

assembly unit (21) and the drive unit (22) is provided, preferably by means of a connecting shaft (241).

3. Drive apparatus according to Claims 1 or 2, **characterized**
5 **in** that on the drive unit (22) a guide unit (23) is detachably mounted - the guide unit (23) optionally providing additional support for the drive shaft (9), for which purpose it is provided with a bearing element (913) - and which guide unit (23) supports by means of guide
10 shafts (232), the axes of which run parallel to the axis (x) of the load shaft (7), one or two top guide elements (231), guide wheels or sliding elements spaced as closely as possible together and running in a top guide channel (14) of the rail (1).
- 15 4. Drive apparatus according to Claims 1, 2, or 3, **characterized in** that the traveling assembly body (210) of the traveling assembly unit (21), the housing (220) of the drive unit (22), and the body (230) of the guide unit (23) are connectable in a form-locking manner by flange
20 elements (216, 236), and are able to be immovably screwed together by at least one mounting screw (24) running completely through the housing (220) of the drive unit (22).
- 25 5. Drive apparatus according to one of Claims 1 through 4, **characterized in** that the traveling assembly unit (21) carries at least one support wheel (2150) provided above the running surface (12) of the rail (1), which support
30 wheel (2150) is able to roll along the inner wall of the rail (1), and/or that the traveling assembly unit (21) carries by means of support shafts (218) parallel to the axis (x) of the load shaft (7) one or two bottom guide elements (215), guide wheels, or sliding elements within a bottom guide channel (16) of the rail (1).

6. Drive apparatus according to one of Claims 1 through 5,
characterized in that the load shaft (7) is a screw, the
shaft (71) of which passes through a hole (242) within a
central component (2102) of the traveling assembly body
5 (210) of the traveling assembly unit (21), and the head
(72) of which is retained in a correspondingly enlarged
hole (2141) which projects at least into the head piece
(2101) of the traveling assembly body (210) of the
traveling assembly unit (21), the enlarged hole (2141)
10 being preferably closable by a securing element (8).
7. Drive apparatus according to one of Claims 1 through 6,
characterized in that the traveling assembly unit (21) is
preferably connected at the bottom to a contacting module
(41) which contacts a two-wire electrical line (52) to
15 supply power, the two-wire electrical line (52) being
located in a channel (11) of the rail (1) below the
running surface (12) for the running wheels (211).
8. Drive apparatus according to one of Claims 1 through 7,
characterized in that the two-wire electrical line (52)
20 comprises a plastic ribbon (522) on which the electrical
lines (521) are provided, and which is provided on both
sides with electrical collars (5221) which lock in to
retaining strips (111, 112) provided on the edges of the
channel (11); and/or that the contacting module (41) has
25 spring-loaded contact pins (411) which are connected to a
circuit board (413) screwed on to the contacting module
(41).
9. Drive apparatus according to one of Claims 1 through 8,
characterized in that the traveling assembly unit (21)
30 carries a control module (42) on the second side opposite
the running wheels (211) above the running surface (12)
for the running wheels (211), the control module (42)
being preferably retained by the wheel shafts (212) of

the running wheels (211); that the control module (42) is connected to the contacting module (41) by power supply lines (414) which preferably pass through a channel (2144) in the body (210) of the traveling assembly unit (21); and that the control module (42) is connected to the drive motor (43) by control lines (431).

10. Drive assembly (2) of the drive apparatus according to one of Claims 1 through 9.

11. Divider element (3) connected to a drive assembly (2) guided within the rail (1) according to Claim 10.