

CONVEYOR APPARATUS

This invention relates to conveyor apparatus for conveying people from one location to another.

Such conveyor apparatus (often referred to as
5 "travelators") is already widely used in public buildings such as airports. Generally speaking, such conveyor apparatus for conveying people travels in a straight line and in a horizontal plane only.

It is a first object of the present invention to provide
10 improved conveyor apparatus for conveying people, which apparatus is capable both of conveying people around curves and at different gradients.

According to the present invention there is provided conveyor apparatus for conveying people, which apparatus
15 comprises an endless platform and driving means for driving the platform around a closed path, the endless platform comprising linked pairs of platform elements, the individual platform elements of each said pair of platform elements being articulated together for pivotal movement
20 about an axis substantially perpendicular to said individual platform elements, and respective elements of each said pair of platform elements being articulated to adjacent elements of the next-most pairs of platform elements for pivotal movement about a substantially
25 horizontal axis, and the driving means including a toothed

rack on each platform element for co-operation with fixed gear wheels.

It is preferred that the individual platform elements of each pair of platform elements be complementarily shaped so as to minimize the gap between the said individual platform elements, no matter whether that portion of the conveyor apparatus containing the said platform elements is travelling in a straight line or round a curve. This is generally achieved by arranging that one of said individual platform elements has a leading or trailing edge which is convexly part-circular in plan and that the other of said individual platform elements has in plan a complementarily concavely part-circular edge of an equivalent radius of curvature.

Preferably at one or more positions in the path of the platform, the platform is arranged to travel beneath a stationary platform, thereby to enable persons using the conveyor apparatus to board and alight from the conveyor apparatus.

In a preferred embodiment, the conveyor apparatus of the present invention is provided with a pair of endless handrails arranged to move with the conveyor apparatus and at the same speed.

Because the conveyor apparatus is for carrying people, it

is of course necessary that people be able to board the conveyor apparatus and to alight therefrom. When the conveyor apparatus includes a pair of handrails as above, the presence of a hand rail can be an impediment to this.

5 In a preferred embodiment, therefore, an endless handrail is arranged to travel beneath a said stationary platform. This may conveniently be achieved by providing pairs of rollers or wheels upstream and downstream of the stationary platform, whereby the handrail travels in a

10 generally S-shaped path from a convenient handrail height to beneath said stationary platform and subsequently traverses a further generally S-shaped path to resume travelling at the handrail height.

The conveyor apparatus of this invention may be driven by

15 one or more electric or hydraulic motors spaced at intervals along the endless path travelled by the platform. If one or more hand rails are present these may be driven by the same motors via suitable transmissions.

The speed of known conveyor apparatus is limited by the

20 need to permit people to board from and alight to a stationary surface.

Conveniently, the apparatus comprises a first endless platform arranged to be driven about a closed path and at least a _____

second endless platform arranged to be driven about a second closed path and at a higher speed than said first endless platform, said first platform being adapted to transfer passengers from a stationary state to the second platform or vice versa.

Preferably, the endless platforms are arranged to run essentially contiguously over parts of their respective paths of travel and which endless platforms are adapted in use to be driven at different speeds.

Two embodiments of a conveyor apparatus for people will now be described, by way of example only, by reference to the accompanying drawings, in which:

Figure 1 is an overall plan view of a first embodiment of a conveyor apparatus according to the present invention;

Figure 2 is a plan view, partly broken away, of a pair of platform elements of the conveyor apparatus of Figure 1;

Figure 3 is a side view of the platform elements of Figure 2;

Figure 4 is a sectional view along the line A-A of Figure 1;

Figure 5 is a detailed side elevation, partly broken away, of a hand rail of the apparatus of Figure 1;

Figure 6 is a sectional view along the line D-D of Figure 1; and

Figure 7 is a diagrammatic fragmentary plan of a second embodiment of a conveyor apparatus according to the present invention.

Referring to Figures 1 to 6 of the drawings, a conveyor apparatus 1 comprises linked pairs of platform elements 2, 3. Each platform element 2 is linked to its pair element 3 for pivotal movement about a pivot pin 4 having an axis substantially perpendicular to said platform elements 2, 3.

As can be seen from Figure 2 of the drawings, a leading edge 5 of a forward part 6 of platform element 2 is part-circular in plan, the part-circle having as its centre the axis of pivot pin 4. Platform element 3 is provided with a shallow tray-like depression 7 for receiving the forward portion 6 of platform element 2. This depression 7 is provided with a part-circular periphery 8 also centred on the axis of pivot pin 4 to lie closely adjacent the leading edge 5 of platform element 2. Base portions 9, 10 of platform elements 2, 3 are complementarily chamfered in plan (at 11) and in side elevation (at 12) (see Figures 2, 3) to permit articulation of the platform elements about both generally vertical and generally horizontal axes.

Rearward end 13 of platform element 2 and forward end 14 of platform element 3 are each generally rectangular in plan (see Figure 2).

5 A pair of horizontally extending pivot pins 15, 16 is provided at the forward end 14 of each platform element 3. A complementary pair of horizontally extending 17, 18 apertures is provided in rearwardly extending lugs 19, 20 of rearward end 13 of each platform element 2. By locating the pins 15, 16 of each platform element 3 in 10 the apertures 17, 18 of its next-most platform element 2 there is constructed the conveyor apparatus, the respective ends of which are eventually linked to form the endless platform 1 having generally vertical and generally horizontal articulation.

15 Each pair of platform elements 2 and 3 is provided with four supporting wheels 21 which are arranged to run on one stationary track 21a on each side of the endless platform 1. Each base portion 9, 10 of platform element 2, 3 includes an axial toothed rack 22, and is arranged 20 to be driven along the axial direction by fixed gear wheels 22' in mesh with the rack 22.

The tray-like depression 7 of each platform element 3 is provided with roller wheels 23 protruding slightly above the surface of depression 7 and arranged tangentially to 25 a circle having the pivot pin 4 as its axis, for supporting forward part 6 of platform element 2 in its

pivotal movement about pivot pin 4.

Further roller wheels 24, 25 and 26 are provided respectively on platform elements 2, 3 for locating the endless platform in a track therefor, and to enable the smooth travel of the platform in its track.

Referring now to Figures 1, 4 and 5, it will be seen that the conveyor apparatus includes a pair of handrails 27, 28. These handrails 27, 28 are endless and are supported respectively to either side of the platform 1 and at a convenient height for use by persons travelling on the conveying apparatus.

Electric motors 29 are spaced along the path of travel of platform 1 and are arranged to drive the platform 1 along its path through gearboxes 30 and the gear wheels 22'. The handrails 27, 28 are driven by the same motors 29 via transmissions 31.

As may be seen from Figures 1 and 6, a stationary, boarding and alighting platform 32 is provided at one point in the path of travel of the platform 1. The platform 1 is arranged to pass beneath platform 32 as shown in Figure 6. In order to facilitate boarding and alighting, the handrails 27, 28 are carried below the platform 32 by arranging for the handrails to travel in S-shaped paths about pairs of wheels 33, one of which is shown in Figure 5.

Referring now to Figure 7 of the drawings, there is shown a second embodiment of a conveying apparatus 34 according to the present invention. The apparatus 34 comprises two endless platforms 35 and 36 arranged to run essentially contiguously over parts of their respective paths of travel and adapted in use to operate at different speeds. It will be appreciated that there is in practice a relatively low maximum speed at which a conveyor apparatus having a single travelling platform can be operated since travellers on the platform cannot be expected to sprint in order to board the apparatus from a stationary floor or to alight from the apparatus.

By using the two endless platforms 35 and 36, the latter running at, say, twice the speed (the maximum speed as aforesaid) of the former, travellers may transfer from the low-speed platform 35 to the high-speed platform 36 thus to travel to their destination more quickly. At the destination end of travel a further low-speed platform will generally be provided to allow travellers to reduce their rate of progress for alighting.

Thus the high-speed platform 36 serves to transport passengers, whereas the low-speed platform 35 serves to transfer passengers from a stationary to the high-speed platform 36 or vice versa. It is envisaged that two or more transfer platforms running at progressively higher speeds may be provided at each end of the apparatus 34 so as to allow for progressively greater speeds of passenger transport.

In this particular embodiment, each endless platform 35, 36 has a construction substantially identical with that of the platform 1 described above.

5 The invention may be performed otherwise than as has been particularly described and the invention includes within its scope all modifications and variations which would be apparent to one skilled in the art and which fall within the scope of the appended claims.



CLAIMS.

1. A conveyor apparatus for conveying people, which apparatus comprises an endless platform and driving means for driving the platform around a closed path, the endless platform comprising linked pairs of platform elements, the individual platform elements of each said pair of platform elements being articulated together for pivotal movement about a substantially vertical axis, and respective elements of each said pair of platform elements being articulated to adjacent elements of the next-most pairs of platform elements for pivotal movement about a substantially horizontal axis, and the driving means including a toothed rack on each platform element for co-operation with fixed gear wheels.
2. A conveyor apparatus according to claim 1, wherein individual platform elements of each pair of platform elements are complementarily shaped so as to minimize the gap between the said individual platform elements.
3. A conveyor apparatus according to claim 1 or 2, wherein at one or more positions in the path of the platform, the platform is arranged to travel beneath a stationary platform, thereby to enable persons using the conveyor apparatus to board and alight from the conveyor apparatus.



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4. A conveyor apparatus according to any one of claims 1 to 3, which is provided with a pair of endless hand rails arranged to move with the conveyor apparatus and at the same speed.
- 5 5. A conveyor apparatus according to any one of the preceding claims and comprising a first endless platform arranged to be driven about a closed path and at least a second endless platform arranged to be driven about a second closed path and at a higher speed than said first
10 endless platform, said first platform being adapted to transfer passengers from a stationary state to the second platform or vice versa.
6. A conveyor apparatus according to claim 5, wherein the endless platforms are arranged to run essentially
15 contiguously over parts of their respective paths of travel.
7. A conveyor apparatus for conveying people from one location to another, substantially as hereinbefore described with reference to the accompanying drawings.
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