MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL No. 1010
(ANSI and ISO TEST CHART No. 2)
COMMONWEALTH OF AUSTRALIA

CONVENTION APPLICATION FOR STANDARD PATENT OR A STANDARD PATENT OF ADDITION

Full name(s) of Applicant(s)
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hereby apply for the grant of a standard patent of addition
for an invention entitled

"SELF-DRIVEN CARRIAGE, FOR SORTING PLANTS"

which is described in the accompanying complete specification.

DETAILS OF BASIC APPLICATION(S)
Number(s) of Basic Application(s)
20779 B/85

Name(s) of Convention Country(ies) in which Basic Application(s) was/were filed
Italy

Date(s) of Basic Application(s)
13 February 1985

My/Our address for service is:
C/- Spruson & Ferguson
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Dated this 12th day of February 1986

To: The Commissioner of Patents

FRANCESCO CANZIANI

1/86
We, FRANCESCO CANZIANI

of Via Contardo Ferrini 21,
San Macario, Varese, Italy

do solemnly and sincerely declare as follows:—

1. I am/We are the applicant(s) for the patent
   (or, in the case of an application by a body corporate)

2. The basic application(s) as defined by Section 141 of the
   Act was/were made

3. I am/We are the actual inventor(s) of the invention referred
   to in the basic application(s)
   (or where a person other than the inventor is the applicant)

4. The basic application(s) referred to in paragraph 2 of this
   Declaration was/were the first application(s) made in a Convention
   country in respect of the invention of the subject of the application.

Declared at Varese this 21st day of January 1986

To: The Commissioner of Patents

Signature of Declarant(s)
FRANCESCO CANZIANI
The invention relates to a carriage for conveying and sorting machines, comprising a frame running along a monorail by means of idle wheels, and provided with an independent motor group actuating driving wheels that run along said monorail.

Claim
1. A self-driven carriage providing for a frame having idle wheels and capable of moving along a fixed path consisting of a monorail, and for a motor unit, hinged at said frame, comprising an electric motor that actuates at least one pair of opposite driving wheels, acting on said monorail, there being provided means for rotating said motor unit in order to keep said driving wheels pressed against said monorail.

2. A self-driven carriage for sorting plants, comprising:
a) a frame provided with idle wheels, capable of running along a path consisting of a monorail;
b) a unit comprising an electric motor and transmission gears, hinged at said frame and capable of actuating a pair of driving wheels that act on said mono-rail from opposite sides;
c) elastic means suitable for rotating said motor/transmission unit, in order to keep the driving wheels always pressed against the rail;
d) means suitable to discharge the carried items at either side of the path.
To the Commissioner of Patents

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE:

Class 53464/86, Int. Class

Complete Specification Lodged:

Accepted:

Published:

Priority:

Related Art:

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Complete Specification for the invention entitled:

"SELF-DRIVEN CARRIAGE, FOR SORTING PLANTS"

The following statement is a full description of this invention, including the best method of performing it known to me.
ABSTRACT

The invention relates to a carriage for conveying and sorting machines, comprising a frame running along a monorail by means of idle wheels, and provided with an independent motor group actuating driving wheels that run along said monorail.
The present invention provides for a self-driven carriage for sorting plants, wherein the items to be sorted are placed, after codifying operations, on carriages or conveying planes that move along a fixed path, from which they are then automatically discharged when passing before the respective collecting zones.

The carriage according to the invention is provided with independent motor means for controlling the motion thereof, and with further motor means, independent from the first ones, for controlling the discharge of the conveyed items; the carriage is meant to move along a path consisting of a mono-rail, and is equipped with hinged coupling means for the connection with analogous carriages.

There are known selecting and sorting apparatus wherein the items are laid on carriages or transport planes connected to one another and forced to move along a fixed path by means of chains or other similar systems.

The discharge of the items, controlled by cams, rails or the like set all along the path, takes place either by tilting of the conveyor plane or by action of a pusher element that runs along the plane on which the item has been laid.

These systems, however, involve building complications and require, whenever changes to the path need to be made, too expensive interventions, and also the shut of the plant even over long periods of time.

There are also known carriages wherein the conveyor plane consist of a revolving belt actuated by a motor that moves along with the carriage, so that mechanical means set along the path need not be used, to effect the discharge.
More recently, there was a provision for a plant equipped with self-driven carriages, as described by the Italian Patent Application No.22264 A/84 by the same Inventor, a plant wherein some at least of the carriages are provided with independent motors, which allows to spare the dragging devices and to obtain a considerable simplification in the entire structure, which is very flexible as well.

The carriage of the present invention is meant to be used in connection with the plants such as the ones just mentioned.

It stands out from the previous ones due to a simpler building (particularly as concerns the means for making the carriage move forward) and more practically (consisting essentially in the upkeep operations and repair interventions being simpler).

Furthermore, unlike other known carriages, requiring guide rails and separate rails on which act the driving wheels, the carriage according to the invention has only one simple mono-rail for both functions.

The present invention will be now described in detail, with special reference to the enclosed figures, in which:

- Fig. 1 shows a section of a carriage according to the invention;
- Fig. 2 shows a section of the carriage according to the line I-I of Fig. 1;
- Fig. 3 shows the partially sectioned view according to the arrow A of a carriage according to the invention;
- Fig. 4 is the partially sectioned view of a carriage according to the invention, seen from above.

The carriage (see Fig.1) consists essentially of a support
structure 1, that runs along a monorail 2, of a motor unit 3 and of a conveying and discharging unit indicated as a whole by No. 4.

The support structure 1 comprises a frame 5 leaning on the upper edge 6 of the monorail by means of a pair of idle wheels (front and rear) 7, and being provided with a pair of uprights 8, set at both sides of the monorail, on which there are mounted opposite idle wheels with vertical axis 9, that run on the walls of the monorail itself to avoid side shiftings of the carriage.

In the lower part of uprights 8 there are idle wheels 10 with horizontal axis, that run in contact with the underside of a pair of flanges 11 of the monorail.

The carriage that moves in the direction of arrow V can therefore run along the monorail by means of wheels 7; the idle wheels 9 keep the front part of the carriage exactly positioned on the monorail, while the positioning of the rear part is carried out by the driving wheels, as will be hereinafter described.

To frame 5 there is fixed a substantially vertical shaft 12 at which is hinged the support 13 of an electric motor 14.

To the shaft of motor 14 is keyed a pinion 15, which engages a crown 16 secured to a toothed wheel 17 which, in its turn, gives a rotary motion to an analogous wheel 18. Wheels 17 and 18 are keyed on vertical shafts 19 that are mounted on support 13 by means of bearings; at the lower end of said shafts there are secured a pair of driving wheels 20 engaging, from opposite sides, the monorail 2.

Motor 14 makes the driving wheels 20 rotate, through crown 16 and the toothed wheels 17, 18. Wheels 20, moreover, keep
the front part of the carriage properly positioned on the monorail itself.

With a view to allowing, when necessary, the coupling of a number of carriages (one thereof drawing the others), frame 5 comprises as well a pair of hinges 21, to which are secured dragging bars, besides one or more absorbers, not shown in the drawings.

There is also present a spring 25 or the like, linking motor 14 to frame 5, exerting a tractive force tending to rotate the motor unit anti-clockwise, as shown by arrow C in Fig. 4. This is for keeping the adhesion between the driving wheels and the mono-rail constant. In particular, when the carriage has to run along very curved stretches, the spring 25 holds the motor unit (as well as the driving wheels) in such a position that the wheels 20 are compressed against rail 2.

In the upper part there are the means for conveying and discharging the items to be sorted, that may consist either of tilttable plates (that can be actuated mechanically or, preferably, each by an electric motor mounted on the relevant carriage) or, as illustrated in the drawing, of a rotating belt 24 mounted on a pair of rollers 22 parallel to the direction of feed of the carriage and mounted in their turn on the frame of said carriage.

The rollers 22 of the rotating belt are actuated by a motor 23 preferably of the permanent magnet direct current type, as its acceleration characteristics allow the same to be controlled very quickly: among other things, it is possible to adapt its speed almost instantaneously to the sizes of the discharge stations, and to make said speed fit at any
time to the plant requirements. Either motor 23, 14 are fed, by sliding contacts 26, from feed rods set along the path and not shown in the drawings. During working, the carriage is forced by motor 14 to move along the monorail 2. The items to be sorted, after codifying, are placed each upon a carriage. As the carriages pass before the collecting areas, a central control unit of known kind sends tension to the feed rods to which motor 23 is linked; then belt 24 will be set in motion and, while rotating, will discharge the item at one side or the other of the path.

The particular shaping and arrangement of the parts permits to obtain several advantages in respect of the known apparatus.

First of all, the structure of the monorail is very simple and unexpensive, and the carriages can be mounted thereupon in a very quick and easy way.

Due to the fact that each carriage is provided with an independent motor, it is possible to vary at will the capacity of the whole apparatus, by increasing or decreasing the amount of carriages, according to the requirements. The carriage, thus devised, can even move along twisted and/or sloping paths, and the apparatus can be fitted without problems to the existing rooms.

In plants such as the one herein described, the tension of the employed current should be very low, for safety reasons; this, however, does not permit to fully exploit the characteristics of the permanent magnet motors.

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Of course the sizes, as well the employed materials, can vary as a function of the requirements of use.
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CLAIMS

The claims defining the invention are as follows:

1. A self-driven carriage providing for a frame having idle wheels and capable of moving along a fixed path consisting of a monorail, and for a motor unit, hinged at said frame, comprising an electric motor that actuates at least one pair of opposite driving wheels on said monorail, there being provided means for rotating said motor unit in order to keep said driving wheels pressed against said monorail.

2. A self-driven carriage for sorting plants, comprising:
   a) a frame provided with idle wheels, capable of running along a path consisting of a monorail;
   b) a unit comprising an electric motor and transmission gears, hinged at said frame and capable of actuating a pair of driving wheels that act on said mono-rail from opposite sides;
   c) elastic means suitable for rotating said motor/transmission unit, in order to keep the driving wheels always pressed against the rail;
   d) means suitable to discharge the carried items at either side of the path.

3. A carriage according to claim 2, wherein said means for the discharge of the conveyed items consist of a tiltable plate.

4. A carriage according to claim 2, wherein the means for discharging the conveyed items consist of a revolving belt.

5. A self-driven carriage according to claim 1, wherein the motor group that controls the feed of the carriage comprises an electric motor that actuates one pair of toothed wheels keyed on vertical shafts, to the lower end of which
there are secured opposite driving wheels that act on the monorail from opposite sides.

6. A self-driven carriage according to claim 4, wherein the motor that actuates the revolving belt is a permanent magnet direct current motor, said motor being fed, to effect the discharge of the carried items, by a current impulse having a voltage higher than the nominal one, and a duration of few milliseconds.

DATED this TWELFTH day of FEBRUARY 1986

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