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(12) # EUROPEAN PATENT APPLICATION

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(71) Applicant: **DECCO-RODA S.p.A., Via Consolare, 2952, I-47032 Bertinoro (Forli') (IT)**

(72) Inventor: **Roda, Cesare, Via Don Minzoni 600, I-47023 Cesena (Province of Forli') (IT)**

(74) Representative: **Modiano, Guido et al, MODIANO, JOSIF, PISANTY & STAUB Modiano & Associati Via Meravigli, 16, I-20123 Milan (IT)**

(54) **Device for sensing the diameter of orchard and horticultural produce, for selecting lines on the basis of the organolectic characteristics of the produce.**

(57) The invention relates to a device for sensing the diameter of orchard and horticultural produce, for selecting lines on the basis of organolectic characteristics of the produce. The device comprises roller conveyor means (1–5b) operative to move forward in an orderly row said orchard and horticultural produce, and means (6, 7) operative to cause the produce (11) to rotate on said conveyor means (1–5b). Placed beside said conveyor means are a set of lighted microcells (9), laid transversely to the direction of advancement of the conveyor means (1–5b) and adapted to be partly blanketed by the outline of said orchard and horticultural produce (11) moving past them.

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DEVICE FOR SENSING THE DIAMETER OF ORCHARD AND HORTICULTURAL PRODUCE, FOR SELECTING LINES ON THE BASIS OF THE ORGANOLECTIC CHARACTERISTICS OF THE PRODUCE

This invention relates to a device for sensing the diameter of orchard and horticultural produce, for selecting lines on the basis of organolectic characteristics of the produce.

Known is the need to select orchard and horticultural produce on the basis of such characteristics as their size, color, and the like, after harvesting, such selection being effective to identify the various choices.

That selection is currently performed, preferably automatically on suitable lines whereinto the harvested produce is distributed.

However, known selecting lines are not generally capable of determining with accuracy the diameter of the orchard and horticultural produce, nor of operating at the required speed with sufficient delicacy to avoid damaging the produce.

It is the aim of this invention to solve that problem, by providing a device which, when introduced in a selection line for orchard and horticultural produce, enables the diameter thereof to be accurately sensed.

Within the above aim, it is a further object of the invention to provide a device for sensing the diameter of the orchard and horticultural produce of simple design, reliable and versatile in use, and of

relatively economical cost.

This aim and this object are both achieved, according to the present invention, by a device for sensing the diameter of orchard and horticultural produce, for selecting lines on the basis of organolectic characteristics of the produce, which is characterized in that it comprises roller conveyor means operative to move forward in an orderly row said orchard and horticultural produce, means operative to cause said produce to rotate on said conveyor means, a set of lighted microcells laid beside said conveyor means, distributed transversely to the direction of advancement thereof and adapted, on said orchard and horticultural produce moving past them, to be partly blanketed by the outline of said produce.

The invention details will be more readily apparent from the detailed description of a preferred embodiment of the device for sensing the diameter of orchard and horticultural produce, as illustrated by way of example in the accompanying drawing, the one figure whereof shows a vertical cross-section view of the device in question.

With reference to that figure, the device for sensing the diameter of orchard and horticultural produce comprises a so-called singling device, effective to cause the orchard and horticultural produce to be selected to move forward in an orderly row. That device includes in a substantially known manner, a roller conveyor 1 driven by a chain 2 which wraps around a vertical plane and has a

horizontal upper run.

Each link in the chain 2 has a pin 3 extending horizontally, transverse to the longitudinal extension of said chain 2. In at least one side of said pins 3 is a sleeve 4, mounted rotatably, in axial alignment with a pair of side-by-side rollers 5a,5b, having a symmetrically converging frusto-conical profile. The sleeve 4 also defines a small coaxial wheel 6. The sleeve 4, rollers 5a,5b, and wheel 6 are preferably formed from a plastic material as a one-piece construction.

The small wheel 6 is preferably in contact with a belt 7 which is rotatable along an annular path defining a vertical plane, said belt having a horizontal upper run, parallel to said horizontal upper run of said chain 2.

Located above the roller conveyor 1, are a pair of small juxtaposed walls 8a, 8b respectively, lateral to rollers 5a, 5b. On one of those small walls, 8b in the drawn instance, there are arranged a set of lighted microcells 9 distributed vertically; it is expediently contemplated that such lighted microcells 9 be orderly arranged in two vertical rows offset to each other such that each microcell in one row occupies a vertically intermediate position to that of two contiguous microcells in the flanking row.

Between the rollers 5a, 5b and small walls 8a, 8b, moreover, there are symmetrically interposed guides 10a, 10b, substantially shaped to extend the taper of the rollers themselves.

The device heretofore described operates as follows. In a known manner, the orchard and horticultural produce to be selected is conveyed to the singler 1 so as to be distributed in an orderly row. Each fruit, in fact, arranges itself, as indicated at 11 in the drawing, within the cavity defined between two adjacent pairs of rollers 5a, 5b.

At the area where the small wheels 6 of the roller conveyor engage with the belt 7, which is driven at a different peripheral speed from the chain 2, the rollers 5a, 5b are imparted with an axial rotation, by virtue of the pivotal mount of the related sleeve 4 on the pin 3 which bonds them to the chain 2.

The belt 7 causes, in fact, the rotation of the small wheel 6 on the pin 3. Owing to that rotation, the fruit 11 is also imparted with a rotation about an axis extending horizontally across the direction of advancement.

On moving past the lighted microcells 9, whose beam is reflected from the opposed small wall 8a, the fruit 11 causes a partial blanketing thereof in varying extents according to the size of the fruit and adapted, therefore, to allow that size to be sensed.

The concurrent axial rotation of the fruit 11 allows the entire periphery of the fruit to be scanned such as to sense, and suitably store, the maximum fruit diameter.

It should be pointed out that, by providing two

offset rows of lighted microcells 9, the detectable dimensions can be scanned almost continuously, thereby the measurement taken is highly accurate.

In practicing the invention, any materials, shapes and dimensions may be used according to requirements.

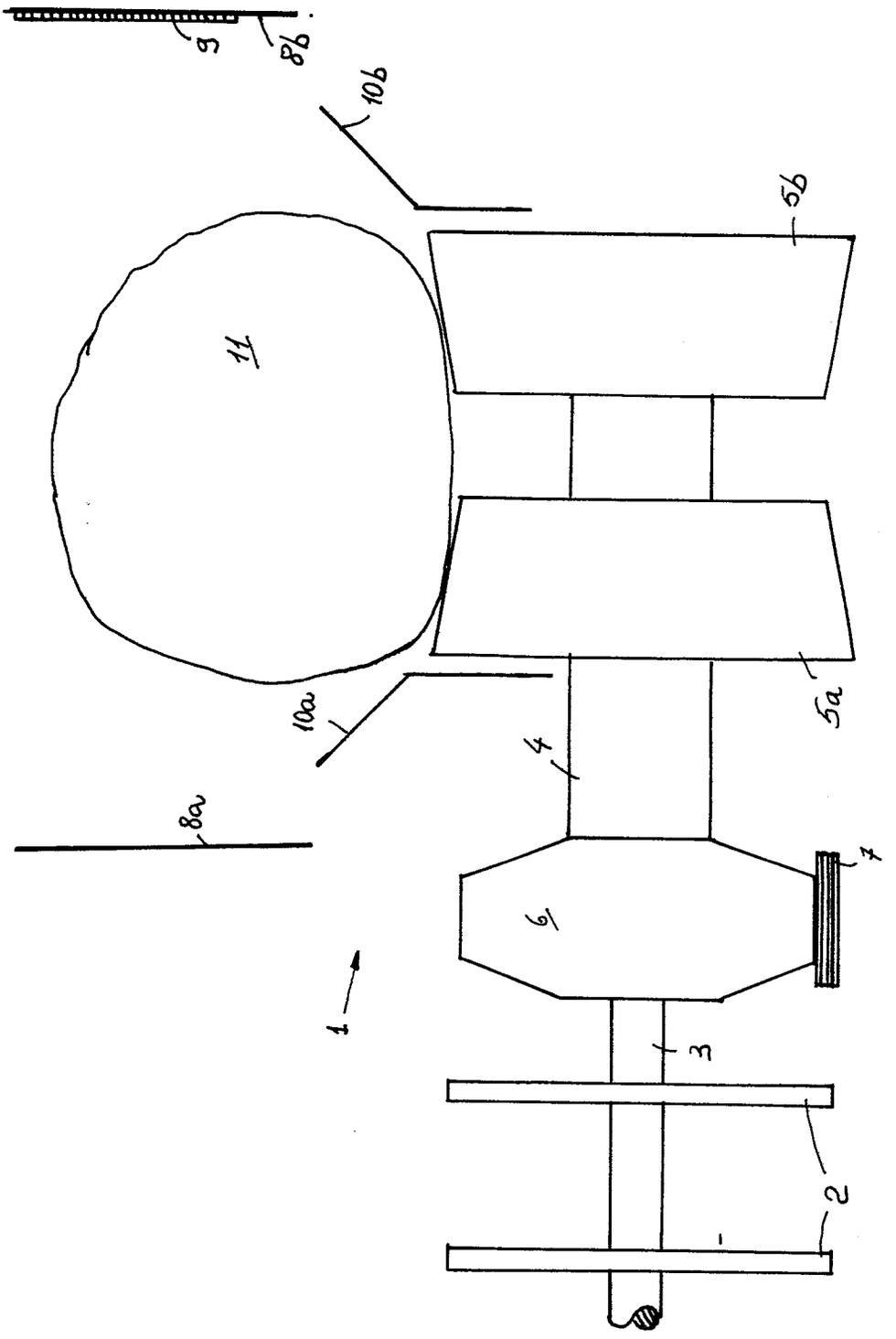
CLAIMS

1. A device for sensing the diameter of orchard and horticultural produce, for selecting lines on the basis of organolectic characteristics of the produce, characterized in that it comprises roller conveyor means (1-5b) operative to move forward in an orderly row said orchard and horticultural produce (11), means (6,7) operative to cause said produce to rotate on said conveyor means (1,5b), a set of lighted microcells (9) laid beside said conveyor means (1-5b), distributed transversely to the direction of advancement thereof and adapted, on said orchard and horticultural produce (11) moving past them, to be partly blanketed by the outline of said produce (11).

2. A device according to Claim 1, characterized in that said roller conveyor means comprise pairs of side-by-side rollers (5a, 5b) having a frusto-conical and converging profile, which rollers (5a, 5b) are mounted on a sleeve (4), axially rotatable about pins (3) transverse to said roller conveyor means (1-5b) having a horizontal unwinding run, said means (6,7) adapted to cause rotation of the orchard and horticultural produce comprise a small wheel (6) respectively coaxial and rigid with said pairs of side-by-side rollers (5a, 5b) and adapted to come peripherally into contact with a belt (7) driven rotatably along an annular path having a related run parallel to said horizontal unwinding run of said roller conveyor means (1-5b).

3. A device according to Claim 1, characterized in that it comprises, above said roller conveyor means (1-5b), a pair of small juxtaposed vertical walls (8a,8b) and respectively lateral to said rollers (5a,5b), on one of said small juxtaposed vertical walls (8a,8b) there being arranged said set of lighted microcells (9).

4. A device according to Claim 1, characterized in that said set of lighted microcells (9) are orderly arranged in two parallel rows offset with respect to each other.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EUROPEAN SEARCH REPORT

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Application number

EP 84 11 3961

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.⁴)
Y	US-A-3 013 661 (L.A. STRUBHAR) * Figures 1-3; column 2, line 44-column 3, line 17 *	1,3,4	B 07 C 5/10 B 07 C 5/02
A	---	2	
Y	FR-A-1 600 396 (M. VIANDON) * Whole document *	1,3	

Y	US-A-4 120 403 (S.P. STEPHANOS) * Figures 1,2; column 1, line 51-column 2, line 19; column 2, line 55 - column 3, line 11 *	1,3,4	
	---		TECHNICAL FIELDS SEARCHED (Int. Cl.⁴)
A	US-A-2 675 917 (J.B. POWERS) * Figures 1-4; column 2, line 21-column 3, line 33; column 5, lines 9-29 *	1	B 07 C

P,A	FR-A-2 528 972 (P. DUNEAU) * Figures 1-3 *	1,3,4	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	06-03-1985	PESCHEL W.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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