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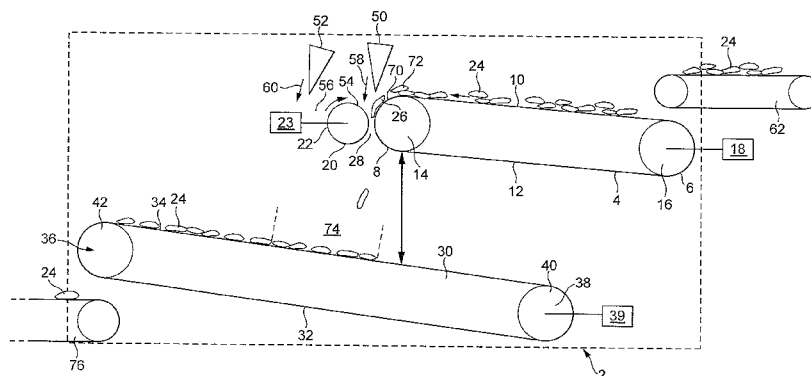


FIG. 1

(57) Abstract: An apparatus for separating products carried on a conveyor, the apparatus comprising an input conveyor, the input conveyor having an upstream inlet end, a downstream outlet end, and a product conveying surface between the upstream inlet end and downstream outlet end, a kick roller located adjacent to the downstream outlet end of the input conveyor, the kick roller having at least a portion of an outer rotational surface located beneath the conveying surface of the input conveyor at the downstream outlet end thereof, an output conveyor located beneath the kick roller, and at least one air knife located above the kick roller and adapted to blow air downwardly at an upstream inlet side of the kick roller and at a downstream side of the kick roller. There is also disclosed an apparatus for separating products carried on a conveyor, the apparatus comprising a conveyor and a brush device located above the conveyor, the brush device including a plurality of downwardly directed brush elements mutually spaced in a direction along the length of the conveyor and adapted intermittently to brush products in a direction along the length of the conveyor.

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER INV. A23L1/164 A23L1/217 B65G47/28 B65G31/02 B65G47/22 B65G47/24 B65G47/26 A23L1/212 B65G47/14 B65G47/30 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A23L B65G		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 890 579 A (YOUNG ROBERT H [US]) 6 April 1999 (1999-04-06) column 1, line 55 - line 60 column 2, line 59 - column 3, line 52 claim 1 figures 1, 6 -----	35-40, 42, 44-52, 54,56-59
X	SU 1 120 934 A1 (VNII SELSKOKHOZ MASH [SU]) 30 October 1984 (1984-10-30) the whole document ----- -/-	35,36, 38,43, 47,48, 50,55
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 11 December 2012		Date of mailing of the international search report 19/12/2012
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Dimoula, Kerasina

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International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DD 213 819 A1 (LANDMASCH FORSCHZENT [DD]) 26 September 1984 (1984-09-26) page 1 figure 1 -----	35,41, 43,47, 53,55
A	KR 2010 0138645 A (KOREA FOOD RES INST [KR]; LEE JAE MIN [KR]) 31 December 2010 (2010-12-31) claim 1; figures 2, 3 -----	1-61
A	EP 0 224 289 A1 (GRASSO KONINKL MASCHF [NL]) 3 June 1987 (1987-06-03) page 1, line 12 - line 23 -----	1-61
A	GB 431 504 A (AXEL UNO SAERNMARK) 2 July 1935 (1935-07-02) the whole document -----	1-61
A	JP 9 240830 A (NIKKA DENSOK LTD) 16 September 1997 (1997-09-16) the whole document -----	1-61
A	WO 03/106308 A1 (GREEFS WAGEN CARROSSERIE [NL]; DE GREEF JACOB HENDRIK [NL]) 24 December 2003 (2003-12-24) the whole document -----	35-61
A	GB 1 547 680 A (GRIMME F H) 27 June 1979 (1979-06-27) the whole document -----	35-61

INTERNATIONAL SEARCH REPORT

International application No.
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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-34

An apparatus for separating products carried on a conveyor, the apparatus comprising an input conveyor, the input conveyor having an upstream inlet end, a downstream outlet end, and a product conveying surface between the upstream inlet end and downstream outlet end, a kick roller located adjacent to the downstream outlet end of the input conveyor, the kick roller having at least a portion of an outer rotational surface located beneath the conveying surface of the input conveyor at the downstream outlet end thereof, an output conveyor located beneath the kick roller, and at least one air knife located above the kick roller and adapted to blow air downwardly towards the kick roller. A method of separating products carried on a conveyor, employing said apparatus, the method comprising the steps of:

- (a) providing an input flow of products on an upper surface of an input conveyor;
- (b) at a downstream end of the input conveyor, engaging upper surfaces of the products with a rotating surface of a kick roller located adjacent to the downstream end, the kick roller having a surface speed higher than a product speed on the input conveyor; and
- (c) passing the products through a gap between the kick roller and the downstream end of the input conveyor to eject the products downwardly onto an output conveyor.

2. claims: 35-61

An apparatus for separating products carried on a conveyor, the apparatus comprising a conveyor and a brush device located above the conveyor, the brush device including a plurality of downwardly directed brush elements mutually spaced in a direction along the length of the conveyor and adapted intermittently to brush products in a direction along the length of the conveyor.

A method of separating products carried on a conveyor, employing said apparatus, the method comprising the steps of:

- (a) providing an input flow of products on an upper surface of an input conveyor;
- (b) providing a brush device located above the conveyor, the brush device including a plurality of downwardly directed brush elements mutually spaced in a direction along the length of the conveyor; and
- (c) intermittently brushing products with the brush device in a direction along the length of the conveyor to separate products on the conveyor.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2012/051347

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5890579	A	06-04-1999	NONE
SU 1120934	A1	30-10-1984	NONE
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