MATERIAL HANDLING USING IMAGING DEVICES ON THE TRANSFERRING VEHICLES TO CONTROL MATERIAL DISTRIBUTION INTO THE RECEIVING VEHICLES

First imaging device collects first image data, whereas second imaging device collects second image data of a storage portion. A container identification module identifies a container perimeter of the storage portion in at least one of the collected first image data and the collected second image data. A spout identification module is adapted to identify a spout of the transferring vehicle in the collected image data. An image data evaluator determines whether to use the first image data, the second image data, or both based on an evaluation of the intensity of pixel data or ambient light conditions. An alignment module is adapted to determine the relative position of the spout and the container perimeter to and generate command data to the propelled portion to steer the storage portion in cooperative alignment such that the spout is aligned within a central zone or a target zone of the container perimeter.
Declarations under Rule 4.17:
— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:
— with international search report (Art. 21(3))

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(15) Information about Correction:
Previous Correction: see Notice of 30 January 2014
A. CLASSIFICATION OF SUBJECT MATTER
IPC(8): B65B 1/48; B65G 67/22 (2013.01)
USPC - 141/95
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)
IPC(8): B65B 1/48; B65G 67/22 (2013.01)
USPC: 141/95

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
IPC(8): B65B 1/48; B65G 67/22 (2013.01) (keyword limited, see terms below)
USPC: 141/94, 95; 348/148; 701/50; 414/540, 345, 396, 404; (Keyword limited, see terms below)

Electronic database consulted during the international search (name of database and, where practicable, search terms used)
PatBase, Google Scholar, Google Patents. Search terms used: fill, refill, replenish, transfer, load, unload, convey, vehicle, conveyor, belt, chute, auger, spout, image, camera, video, tube, holder, hopper, container, truck, trailer, bin, snapshot, picture, identify, detect, sensor, monitor, determine, calculate, measure, fill, level, amount, volume

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>US 2009/0044505 A1 (HUSTER et al.) 19 February 2009 (19.02.2009) entire document, especially: Fig 1, 3, 5, para [0007], [0016], [0017], [0036]-[0039], [0047]-[0054]</td>
<td>1-13, 15-18, 20, 21, 23-26</td>
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<td>Y</td>
<td>US 2010/0042248 A1 (MYLET) 18 February 2010 (18.02.2010) para [0006], [0011], [0023]</td>
<td>14, 19, 22</td>
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☐ Further documents are listed in the continuation of Box C. ☐

* 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
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  "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

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