Claims

1. A method for singulating IC units from a plurality of substrates, the substrates being divided into a sequence of two or more batches in one or more magazines, the method comprising, in a singulation apparatus having a singulation section and a sorting section:

sequentially singulating substrates of a first batch in the singulation section and transporting singulated IC units to the sorting section;

determining that singulated units of a last substrate of the first batch have reached the sorting section;

continuously and sequentially processing substrates of a next batch in the sequence until singulated units of a first substrate of the next batch are ready to be sorted in the sorting section; and

on receiving an indication that singulated units of the last substrate of the first batch have been cleared from the sorting section, continuing sequential processing of substrates of the next batch.

2. A method according to claim 1, wherein said determining comprises determining a boundary between the first batch and the next batch.

3. A method according to claim 2, wherein said determining comprises receiving batch data representing at least a number of substrates in the first batch;

maintaining a count of processed substrates which have reached the sorting section; and

determining when the count of processed substrates equals the number of substrates in the first batch.

4. A method according to any one of claims 1 to 3, wherein at least one batch spans across two or more magazines.

5. A method according to claim 2, wherein said determining comprises detecting a gap between substrates in the one or more magazines.

6. A method according to claim 5, wherein the gap is within a magazine.

7. A method according to claim 6, wherein the magazine is an empty magazine.

8. A method for singulating IC units from a plurality of substrates, the substrates being divided into a sequence of two or more batches in one or more magazines, the method comprising:

receiving batch data representing, for each batch, a batch identifier and a batch count indicating a number of substrates in the batch;

continuously and sequentially singulating substrates of a first batch of the sequence in a singulation section of a singulation apparatus, and transporting singulated IC units to a sorting section of the singulation apparatus;

incrementing a processed count indicating a number of substrates of the first batch which have been processed in the singulation section;

when the processed count equals the batch count for the first batch, sequentially processing substrates of a next batch of the sequence until singulated units of the first substrate of the next batch are ready to be sorted in the sorting section; and

on receiving an indication that singulated units of the last substrate of the first batch have been cleared from the sorting section, continuing sequential processing of substrates of the next batch.

9. A control system for a singulation apparatus having a magazine carrier, a singulation section and a sorting section, the singulation apparatus being configured to receive a plurality of substrates divided into a sequence of two or more batches in one or more magazines, the control system comprising:

at least one control module for communicating with and controlling the singulation apparatus, the at least one control module being configured to:

instruct the magazine carrier to sequentially present substrates of a first batch and a next batch for processing in the singulation section;

determine that singulated units of a last substrate of the first batch have reached the sorting section;

receive a signal indicating that singulated units of the first substrate of the next batch are ready to be sorted in the sorting section; and

on receiving an indication that singulated units of the last substrate of the first batch have been cleared from the sorting section, instruct the singulation apparatus to continue sequential processing of substrates of the next batch.

10. A control system according to claim 9, wherein the at least one control module comprises a first control module for communicating with and controlling the magazine carrier and components of the sorting section, and a second control module for communicating with and controlling the singulation section.

11. A control system according to claim 9 or claim 10, wherein the at least one control module is configured to determine a boundary between the first batch and the next batch.

12. A control system according to claim 11, wherein the at least one control module is configured to:

receive batch data representing at least a number of substrates in the first batch;

maintain a count of processed substrates which have reached the sorting section; and

determine when the count of processed substrates equals the number of substrates in the first batch.

13. A control system according to claim 11 or claim 12, wherein said control module is configured to detect a gap between substrates in the one or more magazines.

14. A non-transitory machine-readable storage medium having stored thereon a program for controlling a singulation apparatus, the singulation apparatus having a magazine carrier, a singulation section and a sorting section, and being configured to receive a plurality of substrates divided into a sequence of two or more batches in one or more magazines, the program comprising instructions for:

causing the magazine carrier to sequentially present substrates of a first batch and a next batch for processing in the singulation section;

determining that singulated units of a last substrate of the first batch have reached the sorting section;

receiving a signal indicating that singulated units of the first substrate of the next batch are ready to be sorted in the sorting section; and

on receiving an indication that singulated units of the last substrate of the first batch have been cleared from the sorting section, causing the singulation apparatus to continue sequential processing of substrates of the next batch.

15. A non-transitory machine-readable storage medium according to claim 14, further comprising instructions for determining a boundary between the first batch and the next batch.

16. A non-transitory machine-readable storage medium according to claim 15, further comprising instructions for: receiving batch data representing at least a number of substrates in the first batch; maintaining a count of processed substrates which have reached the sorting section; and determining when the count of processed substrates equals the number of substrates in the first batch.

17. A non-transitory machine-readable storage medium according to claim 15, further comprising instructions for detecting a gap between substrates in the one or more magazines.