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(72) Inventors:
• **Fonte, Josep**
08192 Sant Quirze del Valles (ES)
• **Quetin, Arnaud**
08027 Barcelona (ES)

(71) Applicant: **ASEPTIS, S.L.**
08210 Barberà del Valles (ES)

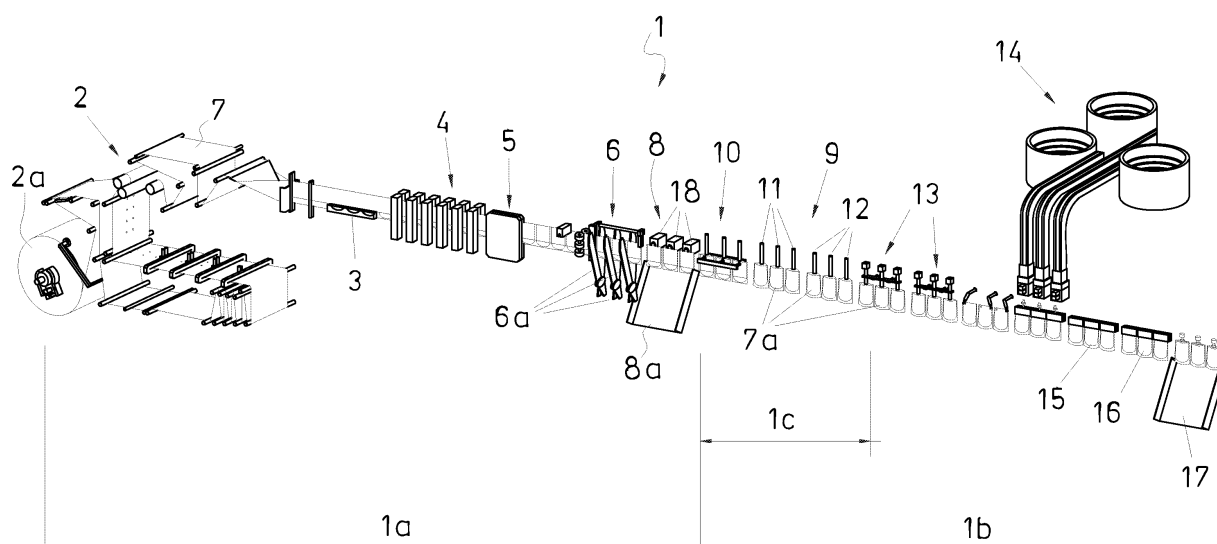
(74) Representative: **Barlocchi, Anna**
Zea, Barlocchi & Markvardsen Patents
C/Balmes 30 1o 1a
08007 Barcelona (ES)

(54) **Horizontal package handling machine**

(57) It comprises at least a package cutting station (6), a package filling station (13) and quality control means (8) located upstream said package filling station (13) allowing valid packages to be fed into said package filling station (13) and preventing defective packages from entering said package filling station (13). It may further include a package decontamination station (9) for

sterilizing the packages (7a) before they are filled in the package filling station (13) so the quality control means (8) are located between the package cutting station (6) and the package decontamination station (9).

Package accumulation is avoided since defective packages may be collected without having to stop the machine. In an aseptic machine, the risk of filling area contamination is also avoided.



Description

[0001] The present invention relates to a horizontal package handling machine including a package filling station in which defective packages are prevented from entering said package filling station.

BACKGROUND OF THE INVENTION

[0002] Package handling machines are known comprising a package forming section including a package cutting station and a package filling section including a package filling station and other stations.

[0003] Packages coming from the cutting station are singly fed into the filling station in which they are filled. In order to carry out such a filling step, each single package must be opened at the upper region thereof. If it does not occur, that is, if one package (or more) enter the filling station closed, the package will fall down and therefore it will not be filled.

[0004] The presence of defective packages in the filling station involves machine downtimes since the operator has to stop the machine, open the station and collect the defective packages therein. This collecting operation is typically carried out when a certain amount of defective packages has been accumulated.

[0005] In the case of an aseptic machine having a decontamination station, besides said downtimes which adversely affect the production process, other disadvantage in prior art package handling machines is due to contamination of the machine and environment when opening the filling station for collecting the defective packages. This forces the process to include an additional step for decontaminating the filling area again.

DESCRIPTION OF THE INVENTION

[0006] According to the present invention, there is provided a horizontal package handling machine which comprises at least a package cutting station and a filling station, and it further includes quality control means allowing valid packages to be fed into the package filling station and preventing defective packages from entering said package filling station.

[0007] The quality control means comprise a package quality control station which may be located upstream said filling station, and more particularly between said package cutting station and said filling station. Therefore, only valid packages are filled in said package filling station.

[0008] The horizontal package handling machine of the invention may be an aseptic machine. In this case, the machine further includes a package decontamination station for sterilizing the packages before they are filled in the filling station, so the quality control means are located between said package cutting station and said package decontamination station.

[0009] In that embodiment of the aseptic machine, the

quality control means operate in such a way that when a defective package is detected, it falls down before entering the decontamination station. The quality control means validate the packages so that they will be properly formed, sealed, sterilized and filled in the machine. If they are found to be defective, they will be rejected through a reject chute or ramp.

[0010] Some embodiments of the invention may provide that the quality control means include package gripping means for holding the packages into the package decontamination station. Said package gripping means may be operated holding the valid packages or releasing defective packages before entering into the package filling section. The quality control means may be, for example, through machine vision or photocells.

[0011] Package accumulation does not involve a problem any more as they may be collected without having to stop the machine. An aseptic machine according to the invention has the additional advantage that the risk of environment and mechanisms contamination in the filling area is avoided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] A particular embodiment of the horizontal package handling machine of the present invention will be described in the following, only by way of non-limiting example, with reference to the appended drawing that shows a diagrammatic perspective view of a horizontal package handling aseptic machine.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0013] As shown in the figure, a horizontal package handling machine according to the invention has been indicated as a whole with reference numeral 1. The machine 1 of the embodiment shown is an aseptic machine that comprises a number of stations grouped into two main sections, namely, a package forming section 1a and a package filling section 1b. The package filling section 1b includes a decontamination section 1c.

[0014] The package forming section 1a shown in the figure comprises a film feeding station including an unwinder 2 with the corresponding reel 2a, a bottom sealing station 3, a vertical sealing station 4, a vertical cooling unit 5, and a package cutting station 6. Said package cutting station 6 is provided with a plurality of scissors 6a (only scissor in case of a single machine -one package per cycle-) for cutting the film 7 coming from the unwinder 2 into single packages 7a such as pouches or sachets. Said packages 7a may be, for the example, of the so called doypack type, that is, those having a stable bottom.

[0015] Downstream the package cutting station 6, quality control means 8 are provided including a package quality control station which prevents defective packages from entering a decontamination station 9 located downstream said package cutting station 6.

[0016] Once the film 7 has been cut into packages 7a

by the scissors 6a, the packages 7a are advanced to the decontamination station 9. When a defective package is detected, the quality control means 8 causes the packages 7a to fall down before entering the decontamination station 9 so that they are not accumulated therein. Defective packages may be collected, without having to stop the machine 1, through a reject chute 8a in the quality control means 8.

[0017] Provision of quality control means 8 in the decontamination station 9 prevents the decontamination section 1c from being fed with defective packages.

[0018] The quality control means 8 are capable of detecting, for example, the following defects in the packages 7a:

- Detection of splicing tape in the reel made by the manufacturer in the reel 2a or the splicing tape made by the operator at the end of the reel 2a. The seal joining the two portions of the reel 2a is detected as a fault. Detection is made, for example, by photocells or machine vision provided in the quality control means 8 or before. Those packages 7a joined by this tape will be rejected before entering the decontamination station 9;
- Detection of fault in the bottom of the packages, cutting fault, off centre weldings, film misalignment will be detected either by a photocell or a machine vision camera;
- Temperature fault detected through a pyrometer fitted in any upstream sealing station. After some period of defined time with the sealing temperature out of range, it will be possible to reject the defective pouches.
- The quality control means 8 can detect faults in data printing (date, lot, etc);
- An extra selector can be programmed to activate continuous rejecting through quality control means 8 in case of machine initial adjustment or other requirements.
- If the machine 1 was stopped for an extended period of time, the packages which are near the vertical sealing station 4 become overheated and deformation of the film 7 may occur. When the machine 1 is started, all the packages 7a which were exposed to overheat are rejected.

[0019] The decontamination station 9 includes hot sterile air nozzles 10 for injecting hot sterile air to packages 7a for their opening and, in case of an aseptic machine to prevent the peroxide from being condensed, nozzles 11 for injecting hydrogen peroxide to packages 7a, and nozzles 12 for injecting hot sterile air again for aerating or removing hydrogen peroxide to packages 7a.

[0020] Filling stations 13, top spout station 14, top seal unit 15, top cooling unit 16 and rejection ramp 17 are provided downstream the nozzles 10, 11, 12.

[0021] The quality control means 8 include package gripping means 18 which may be operated so as to hold the valid packages or release the defective packages. As stated above, said quality control means 8 may be operated through photocells, by program controls, and more preferably by means of machine vision. The image obtained by machine vision is compared to a pattern from a database and a signal is then sent to the package gripping means 18 for holding or releasing the packages depending upon whether they are valid or defective when compared to said pattern.

[0022] Although the embodiment herein described and depicted refers to an aseptic package handling machine it will be understood that the invention may be also applied to any non-aseptic package handling machine.

[0023] On the other hand, any detail modifications considered as convenient may be introduced in the invention provided that the essence thereof that is summarized in the following claims is not altered.

25 Claims

1. A horizontal package handling machine comprising at least a package cutting station (6) and a package filling station (13), **characterized in that** it further comprises quality control means (8) allowing valid packages to be fed into said package filling station (13) and preventing defective packages from entering said package filling station (13).
2. A horizontal package handling machine as claimed in claim 1, wherein said quality control means (8) comprise a package quality control station located upstream said package filling station (13).
3. A horizontal package handling machine as claimed in claim 1, wherein said quality control means (8) comprise a package quality control station located between said package cutting station (6) and said package filling station (13).
4. A horizontal package handling machine as claimed in claim 1, wherein it further includes a package decontamination station (9) for sterilizing the packages (7a) before they are filled in the package filling station (13), said quality control means (8) being located between said package cutting station (6) and said package decontamination station (9).
5. A horizontal package handling machine as claimed in claim 1, wherein said quality control means (8) include package gripping means which may be operated holding the valid packages or releasing defective packages.

6. A horizontal package handling machine as claimed in claim 1, wherein said quality control means (8) include machine vision.
7. A horizontal package handling machine as claimed in claim 1, wherein said quality control means include photocells.

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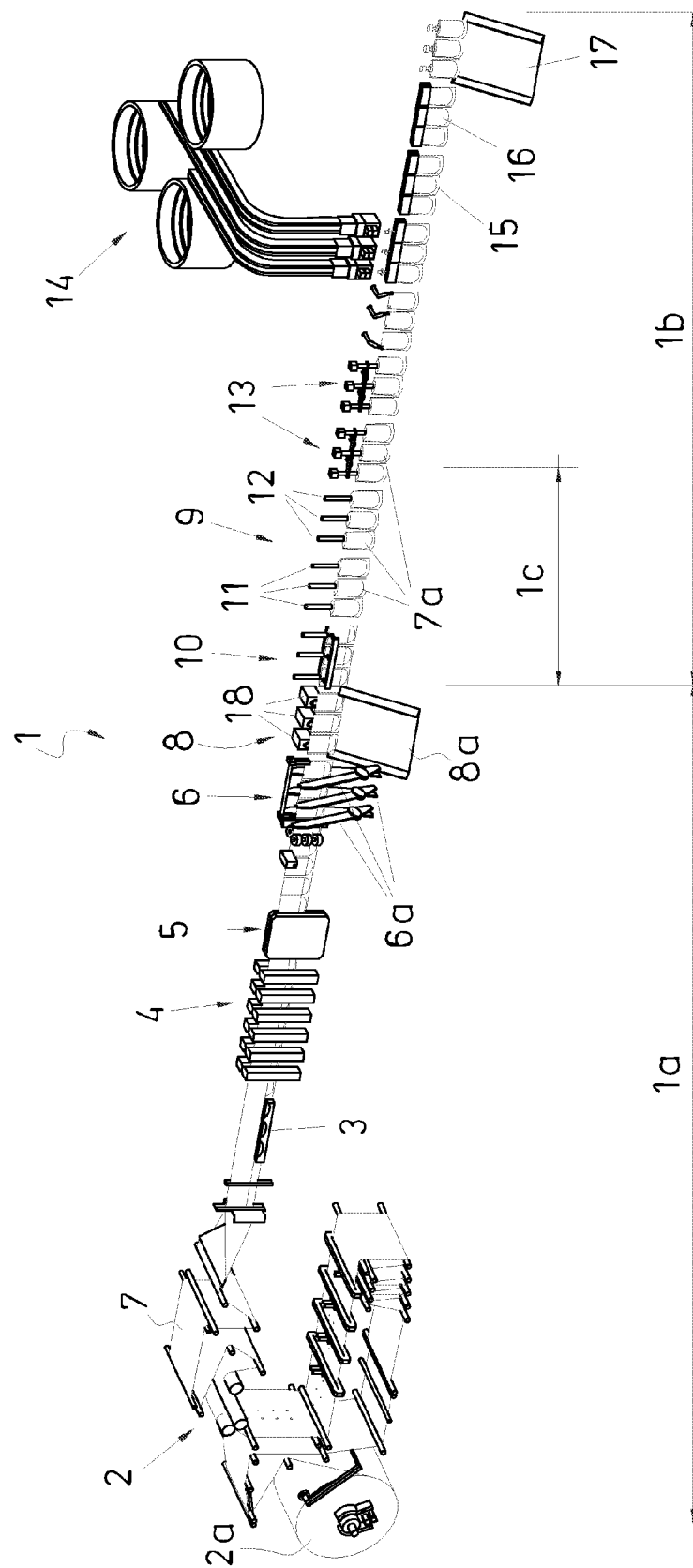
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European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 10 7170

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			TECHNICAL FIELDS SEARCHED (IPC)
			B65B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 10 January 2006	Examiner Grentzius, W
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p> <p>& : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 10 7170

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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