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SYSTEM, PROCEDURE AND COMPUTER PROGRAM PRODUCT FOR PRINTING AN  
INDIVIDUAL SET OF INFORMATION ON A MULTIPLICITY OF INFORMATION CARRIERS

5 **Description**

The invention relates to a system for printing a variety of information carriers with an individual set of information. In a preferred embodiment of the invention, this is achieved by a system configured to fetch a corresponding reference from the storage device within a predefined period of time for an individual information carrier, to fetch and arrange for  
10 the individual information carrier a corresponding set of information from a storage device by means of the reference, and to instruct a printing device to print the fetched and arranged set of information on the individual information carrier.

**State of the art**

15 Traditionally, information carriers, which are to be printed in large numbers with similar contents, are fed individually to a printing device and printed piece by piece. The necessary information for printing on the information carriers is, for example, loaded individually or provided in advance.

This state of the art technology does not achieve an increased sequential processing of  
20 the information carriers.

Alternatively, the information carriers can also be held ready in an endless form, which is continuously fed to a printer. The necessary information for printing the information carriers is held in a queue, for example, where the queue must wait for printing or vice versa, depending on which process was completed first.

25 In principle, the endless alternative does not differ from the piecewise alternative, only the feeding and reloading of information has been automated. However, the slowest component of the system still determines the processing speed.

Furthermore, DE 101 54 496 A1 discloses a printer and a method of printing which enable forms, backgrounds and overlays to be stored in a bit table printer memory to prevent a  
30 formatting time associated with images subject to multiple uses. A background image can, for example, be saved as a bit table representation in an image memory for a slide presentation and recalled as required. This background image is then superimposed with page-specific information prepared in real time, such as the superimposition of a text. The

pre-stored form or background bit table is used to initialise the printer image memory immediately before storing page-specific information.

5 US 2008/062466 A1 discloses a high-speed printing environment in which platform-independent data such as text data, image data or bar code data are stored in a file. After a rendering step, information carriers are printed.

EP 2 463 101 A1 discloses a system and a procedure for the generation and inspection of prints with static and variable contents. The system comprises a printing unit, an inspection unit and a computing unit. The printing and inspection process is automatic,  
10 inline and in real time.

Even these state of the art technologies do not realize the potential of referencing processing.

#### **Presentation of the invention: Task, Solution, Advantages**

15 The proposals described above merely implement conventional processing and printing of the information carriers. However, the potential offered by referencing processing and printing of information carriers remains unconsidered, and consequently no solution is provided for a system for printing an individual set of information on a plurality of information carriers.

20 Therefore, the invention is based on the task of solving the problem described above. The solution according to the invention provides in a first aspect a system for printing an individual set of information on a plurality of information carriers comprising memory means configured to store an individual set of information for each of the plurality of information carriers and to store a sequence of elements for each of the plurality of  
25 information carriers, wherein each sequence has a reference to the corresponding individual set of information, a printing device, which is configured to print each of the information carriers with the corresponding set of information, and a processor, which is configured to fetch the corresponding reference from the storage device for an individual information carrier within a predefined period of time, to fetch and arrange the  
30 corresponding set of information from the storage device for the individual information carrier by means of the reference; to instruct the printing device to print the individual information carrier with the fetched and arranged set of information, and to wait for completion of the printing operation, wherein, according to the invention, database-

supported enveloping takes place, wherein a single sheet printing system is provided which is configured to print at least one delivery note, in particular a covering letter including a postal address, wherein the at least one delivery note is merged with at least one of the information carriers, in particular a ticket, and wherein, optionally, a plurality of information carriers, in particular a plurality of tickets, per shipment and/or per envelope to be sent, are merged with the respective delivery note and are output as a finished shipment from an enveloping system, wherein the plurality of information carriers is a plurality of tickets, wherein the system further comprises a testing device which is configured to compare a single printed ticket with the corresponding set of information, wherein the processor is further configured to instruct the testing device to compare the single ticket within the predefined time period  $t$ : after the printing operation has been completed, to instruct the testing device to compare the individual tickets and to wait for the completion of the testing process, wherein an cutting machine having at least two bar code readers is further provided, wherein the ticket ID code is read with a first bar code reading head and the access control code is read with a second bar code reading head, wherein the read ticket ID is compared with information from a control file, and wherein, if no ticket ID is readable, the access control code is read and compared with information from the control file, and wherein, if neither of the two bar code information is readable and/or can be verified correctly, the ticket is withdrawn with a reading error for manual post-checking by adjusting the enveloping process.

In a first embodiment of the first aspect, the set of information preferably comprises at least two image files. In this case, a first of the image files is preferably a background image file and a second of the image files is a foreground image file, where the background image file is identical for all of the plurality of information carriers and the foreground image file is individually different for each of the plurality of information carriers. In the latter case, it is preferable for the processor to perform the ordering process in such a way that the foreground image file is superimposed on the background image file. In addition, the printing process is preferably performed by the processor in such a way that the foreground image file and the background image file are combined into a predefined set of parameters. In the latter case, the predefined set of parameters is preferably a print job.

In a second embodiment of the first aspect, at least the foreground image file is preferably provided in advance from an external source. Alternatively or additionally, the image files

are preferably saved in a format selected from a group containing TIF files and PNG files. In this case, at least one of the image files is preferably compressed.

5 In a third embodiment of the first aspect, the fetch, fetch and arrange, print and wait steps are preferably carried out under real time conditions during the time span t. In addition, the memory steps are preferably performed separately from the fetch, fetch and arrange, print and wait steps in preparation under their own real-time conditions. Alternatively, the storage steps are performed separately from the fetch, fetch and arrange, print and wait steps in preparation rather than under real-time conditions.

10 In a fourth embodiment of the first aspect each sequence of elements preferably begins with a clear identifier for the identification of the respective information carrier. In this case, preferably each sequence of elements contains the reference to the set of information in the form of a path and file name. In addition, the sequences of elements are preferably saved in a file in ASCII format. In the latter case, the file is preferably saved  
15 in Comma Separated Value (CSV) format.

In a fifth embodiment, the processor is preferably set up to rename each individual reference after printing during the current printing process.

In a sixth embodiment of the first aspect, the processor is preferably arranged to fetch the corresponding next references from the memory device during the current printing  
20 operations for the next plurality of information carriers, to fetch and arrange the corresponding set of information from the memory device by means of the references for the next plurality of information carriers, and to await the completion of the current printing operations. In this case, preferably after completion of the current print operations, the processor is set up to move the current set of information in the storage  
25 device. Alternatively, preferably after completion of the current printing operations, the processor is set up to erase the current set of information in the storage device. In both cases, the processor is preferably configured to perform the printing operation with a first priority, to perform the fetch operation with a second priority less than the first priority, and to perform the move/erase operation with a third priority less than the first and  
30 second priorities. In accordance with the invention, the system further comprises a testing device arranged to compare a single printed information carrier with the corresponding set of information, wherein the processor is further configured to instruct the testing device to compare the single information carrier and to wait for the completion of the

testing process within the predefined time period after the completion of the printing process. In this case, the processor is preferably still set up to log the comparison result in the corresponding sequence of elements within the predefined time span.

In an eighth embodiment of the first aspect, the information carrier is preferably at least one of a single sheet of paper or a continuous sheet of paper.

In a second aspect, a processor is provided for use in a system according to the first aspect as a management device.

In a third aspect, a method is provided for controlling a system to print an individual set of information on a plurality of information carriers, comprising the steps of storing an individual set of information for each of the plurality of information carriers, and storing a sequence of elements for each of the plurality of information carriers, each sequence having a reference to the corresponding individual set of information, within a predefined period of time: - fetching the corresponding reference from the storage device for an individual information carrier, - fetching and arranging the corresponding set of information from the storage device by means of the reference for the individual information carrier, - instructing a printing device to print the fetched and arranged set of information on the individual information carrier, and - waiting for the printing process to be completed, wherein a database-supported enveloping takes place in further steps in accordance with the invention, wherein a single sheet printing system is provided which is arranged to print at least one delivery note, in particular a covering letter including a postal address, wherein at least one delivery note is merged with at least one of the information carriers, particularly a ticket, and wherein optionally a plurality of information carriers, in particular a plurality of tickets, are merged with the respective delivery note per mailing and/or per envelope to be sent and are output as a finished mailing from an enveloping system, wherein the plurality of information carriers is a plurality of tickets, wherein the ticket comprises an access control code and a ticket ID code, wherein the method further comprises the following steps: comparing a single printed ticket with the corresponding set of information by means of a testing device and within the predefined time period t: after the printing operation has been completed, instructing the testing device to compare the individual ticket, and waiting for completion of the testing operation, wherein the steps are further provided: Reading the ticket ID code with a first bar code read head of a cutting machine and reading the access control code with a second bar code read head of the cutting machine, comparing the read ticket ID with

information from a control file and, if no ticket ID can be read, reading and comparing the access control code with an information from the control file, and if neither of the two bar code information is readable and/or can be verified correctly, withdrawing the ticket with a reading error for a manual re-check, by control of the enveloping process.

- 5 In the embodiments, the procedure of the third aspect preferably realises the characteristics of the embodiments of the first aspect.

In a fourth aspect, a computer program product is provided with program code portions for performing the procedure according to the third aspect, when running the computer program product on one or more computer facilities. The computer program product is

10 preferably stored on a computer-readable medium.

In a preferred further embodiment, the procedure is configured as a ticket ordering process.

- A customer can preferably choose an event either by themselves on a ticket order website and/or by telephone on a ticket order hotline. Once the event and the event period have
- 15 been selected, the system checks the availability of the seat and any other conditions. The choice of seat can be made, for example, by means of a seating plan of the event location, wherein the customer prefers to mark a desired seat on the ticket order website, for example by marking the desired seat by mouse click in a seating plan displayed on the ticket order website.

- 20 Preferably, the general ticket production process is as follows. In a first step, the customer orders a ticket in a web portal or in a call centre, especially via telephone. The system checks the availability of the event and/or seat in real time and, if necessary, other parameters relating to the event or the booking of the event. The transaction can be completed directly with the booking.

- 25 After entering the payment parameters, such as credit card number, etc., a system query is sent directly to the credit card issuer, in particular the bank issuing the credit card, in order to check the coverage of the card for the payment. However, any other appropriate procedure for making the payment is also conceivable. For example, payment by direct debit is also possible. In the next step, the customer order is entered into a database. On
- 30 the one hand, this ensures that the seat ordered for the ordered or reserved event or event is blocked for further bookings. On the other hand, this ensures that the physical ticket, i.e. the print of the physical ticket and subsequent dispatch, can be created after checking, for example, the receipt of payment. The system or procedure preferably

always works on a customer and/or priority basis. In this connection, customer-specific means that if a customer has booked tickets for different events, these are created or printed together and/or sent together if necessary. However, the processing of orders, in particular purchase orders, is also possible according to the first-in/first-out principle (FIFO) known from the state of the art. Further preferred is the processing of orders according to different priorities. The processing sequence, in particular the sequence of the print jobs for creating the physical tickets, is determined, preferably in a selection procedure, according to the various priorities of the orders received. The priorities on the basis of which a different processing sequence can take place in a selection procedure can affect or include, for example, an express purchase order, problems that occur with incoming payments, or suchlike.

If several customer purchase orders to be processed have been captured or entered in the system, they can be processed according to the priority status. There is also the option of selecting the customer orders, in particular according to the distributed priorities, and combining them to form a total print job. For example, for reasons of manageability in production, a total print job can include printing approx. 3,000 tickets.

After the selection, in particular the priority selection, the data is retrieved and transferred, whereby an overlay file is created in the database system or by the database system. The overlay file contains variable elements that are combined to form an image. The variable elements include, for example, a ticket bar code, the row and/or seat assigned to the ticket, the ticket or event price and advertising and/or advertising information. However, other variable elements which can be combined to form an image are also conceivable. The database system also creates a definition file that describes which background image is to be printed for which overlay file. The definition file thus determines the assignment of overlay file and background image. The definition file also contains a directory structure. The next step is to load the overlay file and the background image file together with the definition file containing the directory structure onto the production computer. Preferably the definition file contains per line the information for the creation of a ticket, an indication or reference to the overlay image file and the background image file. For example, the total file or definition file for a ticket job of 3,000 tickets can be 9,000 lines. The production computer preferably evaluates the lines of the definition file, wherein the production computer still preferably loads the background image file and the overlay file. Furthermore, the production computer preferably creates

a common image per line from both image elements.

In a particularly advantageous further embodiment, the font from the overlay file is at least locally inverted when a dark background image is present or when dark areas of a background image are present, i.e. the ticket material, i.e. the information carrier, which  
5 normally consists of white paper, is not printed in this area. In particular, no white printing is preferred. As a result, the actual ticket material, i.e. the white paper, generates the font, since the areas around the characters are printed.

With a light background image, the font from the overlay file is printed black (CMYK). It is therefore possible in an advantageous way for tickets to be printed variably with changing  
10 information, which in particular is stored in the overlay file, and background images. During the processing or printing of a print job, a new definition file is processed, especially during the same period, and the overlay images and background images are created and/or merged to form an overall image. In addition, edited print jobs, especially already printed elements, can be moved and/or deleted and/or renamed within the  
15 directories, preferably in parallel and/or simultaneously with the printing process. In particular, overlay images, background images and/or definition files can be moved, deleted or renamed within the directories.

The processing of the printing process takes place within the print computer and/or the production computer according to the following priorities. Priority 1 (Prio 1) = Print,  
20 Priority 2 (Prio 2) = Edit new definition file and create images to be printed, Priority 3 (Prio 3) = Move or delete or rename processed images or already printed images. It is also possible for printed image files to be renamed so that they are marked as edited. Furthermore, it is preferred that a second editing of the same definition file leads to a notice or a stop message, which can only be cancelled by means of predefined or set  
25 rights. The notice or the stop message advantageously prevent a double creation of tickets or a double creation of tickets is only possible for authorised persons. In this way, a desired reprint can be permitted.

In a further preferred embodiment of the procedure, a definition file for the customer order can be generated directly after ordering and a ticket can be printed. This would  
30 allow the entire process described to be carried out in real time, so that a real-time procedure would be available. For example, a real-time procedure could be performed by skipping or omitting the testing and selection procedures between order and database entry.

According to the invention, the procedure includes database-supported enveloping as an additional aspect. In an advantageous manner, during the process described above of ticket ordering and the resulting overlay-file with reference to the background image, additional data can be available in the database, which can be provided as a control file  
 5 which is then printed together as one image on the ticket.

For example, an excerpt from the control file could contain the following data in the following format:

0000136867,0001,0000000000000036683632301,0417063168010150,04,01,0,0,0,0,0,0,  
 10 ,0,0,0,0,F,016028917600230050222900,366836323,128634767

The control file can be another separate and/or standalone file, but it is also possible that the control file is part of the definition file, or that the control file data is included in the definition file in addition to the information needed to create a ticket. The control file, and/or the definition file supplemented by the additional data of the data base, is used  
 15 and/or is generated in order to print a separate delivery note print, i.e. a covering letter including postal address for enveloping and dispatching the tickets. Preferably one DIN4 page per job should be printed on a single sheet printer. This can preferably be a separate process. Furthermore, it is advantageously possible, through the control file, to correctly merge the documents supplied in two different physical input channels, wherein the first  
 20 physical input channel comprises the delivery note and the second physical input channel comprises the tickets belonging to the delivery note, and to synchronise the data read by a reading device. The reading device can be a bar code reader and the read files can be coded in a bar code, especially on the tickets.

For example, the ticket may contain only an ACC code (access control code) and/or an  
 25 additional Ticket ID bar code. In particular, the ACC code and/or the Ticket ID bar code may be printed on the ticket.

The code and/or both codes are read and then compared with the corresponding entry in the control file. The ticket ID code can always be verified in the control file and is available, the ACC code is not always available in the control file for tickets which contain both a  
 30 ticket ID code and an ACC code. The system preferably compares the read ticket ID bar code with the corresponding data stored in the control file. If the read data is correct or matches the information stored in the control file, the control file is preferably supplemented and/or overwritten with the information read from the ACC code.

In a further step after the physical merging of the tickets, in particular after the sorting step, in which, if necessary, several tickets per mailing and/or per envelope to be sent are merged with the respective delivery note, the information is merged and, when output from the enveloping system as a finished mailing, imprinted with a time stamp. The control file processed by the system is also returned and the process is completed. Preferably, the control file includes the time stamp assigned to the transmission.

The extract from the control file could, for example, look like this after the enveloping:

0000136867,0001,0000000000000036683632301,0417063168010150,04,01,0,0,0,0,0,0,0,0,0,0,5,08:21:04,17/10/2013

- Two bar code variants are available to identify the event tickets to be processed. The ticket ID or the ticket ID bar code, also known as bar code 1, is preferred. Due to a change in the ticket layout, tickets may have to be processed without a ticket ID or ticket ID bar code. Advantageously for this case a second bar code, the ACC bar code, also called bar code 2, is provided for the unambiguous allocation of the ticket to be processed. The control file must be adapted in order to be able to uniquely verify ticket ID and/or ACC bar code.

The control file can contain the following information:

- a) The information required for processing the ticket ID can be found in column 3 of the control file, and/or
- b) The information on the ACC bar code required for processing can be found in column 19 of the control file.

- Furthermore, an additional bar code read head must preferably be retrofitted for verification of the bar codes in the cutting machine. The information required for verification must also be retrievable at specified points in the control file. A first read head (read head 1) is set up to process the ticket ID or the ticket ID bar code, a second read head (read head 2) is set up to process the ACC bar code. If a ticket ID is read by read head 1, this is preferably compared with the information from the control file, especially column 3 of the control file. If no ticket ID is readable, the ACC bar code is read and compared with the information from the control file, in particular column 19 of the control file. If neither of the two bar code information is readable and/or can be verified correctly, the ticket is withdrawn with a reading error for a manual re-check by control of the enveloping process.

The following table defines the preferred structure of the control file. The "Data field" column describes exactly one line of the file. The individual fields are separated by commas.

|    |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5  | Data Field                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|    | Job Number                            | 6-digit number with initial zeros; begins at 1                                                                                                                                                                                                                                                                                                                                                                                                                  |
|    | Line number                           | Line number within the control file<br>4-digit number with initial zeros; begins at 1                                                                                                                                                                                                                                                                                                                                                                           |
| 10 | Ticket [Channel 2]                    | Ticket ID, 24 digits, filled with initial zeros                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 15 | DIN A4 single sheet<br>[Channel 1]    | 16-digit number consisting of the following parts:<br>1 - 12 Order number<br>13 -14 Counter that identifies the continuous sheets within an enveloping job. The next sheet has a value higher than its predecessor by one. The counter runs repeatedly from 01-99.<br>15 Indicates which delivery note sheet it is<br>0 - current<br>1 - Group end<br>2 - Trailer bit (run-down)<br>4 - Header bit (OMR stop)<br>e.g. 3 = Group end and run-down<br>16 Reserve: |
| 20 | Number of tickets of the group        | Takes into consideration the group associated with the ticket; indicates the total number of tickets within the group.<br>2-digit number with initial zero                                                                                                                                                                                                                                                                                                      |
| 25 | Sum of individual sheets of the group | Takes into consideration the group belonging to the ticket; indicates the total of the individual sheets for the group; inserts are not taken into account.<br>2-digit number with initial zero                                                                                                                                                                                                                                                                 |
| 30 |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

|    |                                |                                                                                                                        |
|----|--------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 5  | "Group end"?                   | Is the ticket the last one of its group?<br>Appendix?                                                                  |
|    | With attachment 1?'            | 1 for yes, 0 for no                                                                                                    |
|    | With attachment 2?'            | 1 for yes, 0 for no                                                                                                    |
|    | With attachment 3?'            | 1 for yes, 0 for no                                                                                                    |
|    | With attachment 4?             | 1 for yes, 0 for no                                                                                                    |
| 10 | Ticket ejection?               | Should the ticket be ejected after cutting?<br>1 for yes, 0 for no                                                     |
|    | Group ejection?                | Should the whole group be ejected?<br>1 for yes, 0 for no                                                              |
|    | Rundown channel 2 and infeed?  | 1 for yes, 0 for no                                                                                                    |
| 15 | Stop when cutting?'            | Should the machine stop when the ticket has reached the cutting device?'                                               |
|    | Batch kicker                   | Storage of envelopes on the conveyor belt<br>1 = offset to previous position, 0 = for no change                        |
|    | Reserve                        | 0                                                                                                                      |
| 20 | Enveloping status              | Status of the ticket after enveloping run.<br>This field is overwritten by the inserter; the initial letter here is F. |
|    | Ticket (alternative Channel 2] | ACC code, 24 digits, filled with initial zeros (code 128)                                                              |
| 25 | Additional fields              | Information for controlling the ticket printers                                                                        |

The following example shows the contents of the control file before and after enveloping.

30

Control file before enveloping:

0000136867,0001,000000000000036683632301,0417063168010150,04,01,0,0,0,0,0,0,  
0,0,0,0,F,016028917600230050222900,366836323,128634767,

Control file after enveloping:

0000136867,0008,0000000000000036684038601,0417064716010310,02,01,1,0,1,0,0,0,0,  
 ,0,0,0,0,0,08:21:06,17/10/2013

0000136867,0009,0000000000000036684077001,041706473401040,04,01,0,0,0,0,0,0,0,  
 0,0,0,0,0,08:21:07,17/10/2013

5 0000136867,0010,0000000000000036684076901,0417064734010410,04,01,0,0,0,0,0,0,0,  
 ,0,0,0,0,0,08:21:07,17/10/2013

The present invention opens up a number of advantages which can be derived from the study of the following description. The most important advantage is that the referencing processing and printing of the information carriers results in an increase in the throughput  
 10 of the information carriers. It is also a completely new way of processing. Therefore, there is flexibility on the part of the customer (i.e. the provider of the information to be printed).

#### **Brief description of the drawings**

A preferred embodiment as well as some partial aspects of the invention are described in  
 15 more detail below on the basis of the drawing. These show:

Fig. 1 a schematic representation of a system according to the invention in a first aspect;

Fig. 2A a side view of an embodiment of the system according to the invention;

Fig. 2B a perspective view of an embodiment of the system according to the invention;

Fig. 2C another perspective view of an embodiment of the system according to the  
 20 invention;

Fig. 3 shows in principle how the system according to the invention works;

Fig. 4 a printed information carrier that has passed through the system according to the  
 invention; and

Fig. 5 a procedural aspect of the device according to the invention.

25

#### **Preferred embodiment of the invention**

At the outset, it should be noted that subsequent components of the device according to the invention are sometimes associated with its technical implementation (e.g. Atlantic Zeiser™ real-time controller or gamma 70 colour printer) and sometimes by their general  
 30 form (e.g. processor or printing device). However, this does not restrict the general form to the specific technical implementation, but merely represents an embodiment; this also applies to specific numerical values and specifications: as long as these are not technically necessary, they are also merely an embodiment.

It should also be noted that the use of the term 'processor', as is common in processor technology, refers to the most general form of control device; this does not restrict the invention to any implementation or device(s) used to realise the 'processor'.

It should also be noted that the term "real-time system" does not require that the storage  
 5 steps/processes on the one hand and the steps/processes from fetching to waiting on the other hand necessarily run successively in real time. In particular, the storage steps can be set up in a separate real-time step or as offline preparatory steps. In a non-restrictive example, the customer can book an event in the web shop in advance; it is not necessary for a (coloured) admission ticket to be printed automatically immediately afterwards. The  
 10 customer's web shop orders, however, are placed within a given time frame, i.e. the set of information (or the foreground image file) is processed in batch runs immediately after receipt of the order within a two-shift operation. This combination of print jobs also enables a special prioritisation of the printing process of individual tickets, e.g. for express or international dispatch, through various upstream selection procedures that are  
 15 generated in an upstream system. The set of information can thus be compiled in a separate real-time step (it is possible to compare the customer's request for a particular seat online and generate the corresponding foreground image file online) or completely offline (e.g. in an old system it is also possible to record the customer's request for a particular seat first, and in a second step to manually compare the customer's requests  
 20 with the available seat quota, for example, and generate the foreground image file accordingly).

The following abbreviations are introduced: for simplification purposes: ADU Application Device Unit

Software unit that controls a device within the (AZ) controller. AZ ATLANTIC ZEISER"

25 BLS Base Link System

Real-time computer within the AZ-Controller.

CRLF Carriage Return Line Feed

Used in production data files and log files to indicate the end of an entry (record or set of items).

30 CSV Comma Separated Value

ASCII data structured in columns, separated by semicolons. Each line (corresponds to 1 record) is terminated with CRLF.

Each column always contains the same number of characters. FAT Factory Acceptance

Test

LAN Local Area Network SAT Site Acceptance Test

UPS Uninterruptible power supply VAR Value Added Reseller

ERP Enterprise Resource Planning (Software)

5

Furthermore, to simplify the description, the following boundary conditions are defined, all of which are merely non-restrictive examples of the embodiment:

- (1) Several designs/printings of the raw material (information carrier) can be available.
  - 10 (2) A stack size of preferably 3,000 to 4,500 individual products is defined in this way because this size is still suitable for handling.
  - (3) An unlimited amount of raw material is preferably available to the operator at the machine.
  - (4) A customer can book several tickets from one or/and different events and these  
15 tickets are then sent in an envelope. This is why in-line post-production is not preferred, as this leads to a problem when enveloping (correct assignment and sequence per envelope). Production is preferably carried out strictly in sequence. Via a control file, the "group end" and a customer number for the group are coded in a bar code (preferably in the sequence of elements). This code controls the inserter.
  - 20 (5) The end customer operates a self-created database in which preferably all business processes (requirements, organisers, orders, invoices, web interface, etc.) are mapped.
  - (6) The customer's database system currently controls thermal transfer printers, which print only in black, texts, logos and bar codes.
  - 25 Fig. 1 shows a schematic representation of a system according to the invention 1 in a first aspect. System according to the invention 1 comprises a processor (CPU; HW, SW, FW) 10 and a memory device 20. System according to the invention 1 also includes a printing device 30 and an optional testing device 40.
- As indicated by the dashed extension to processor 10, the printing device 30 and the  
30 testing device 40 are controlled by processor 10.
- Fig. 2A shows a side view of an embodiment of the system according to the invention 1, Fig. 2B shows a perspective view of an embodiment of the system according to the invention 1, and Fig. 2C shows another perspective view of an embodiment of the system

according to the invention 1. The system according to the invention 1 has a processor 10 and a memory device 20. In the embodiment shown in Figs 2A and 2B, processor 10 and memory device 20 are located at the bottom and within the system. In the embodiment of Fig. 2C, on the other hand, processor 10 and memory device 20 are arranged in a separate control cabinet. Also shown in Figs. 2A, 2B and 2C are a printing device 30 and a testing device 40, although as shown in Fig. 2C the testing device 40 may be omitted.

Fig. 3 shows in principle how the system 1 according to the invention works;

Both claimed and optional system components are equally listed and described below.

However, this does not mean that the optional components are to be deemed essential to the invention.

#### ERP

As shown in Fig. 3, the ERP system 1 generates the file (sequence of elements) according to the orders received, which is fed to the printing machine 30. The image data (information record) is preferably generated via a manual process that is tracked in the ERP.

The image data and the file are transferred from ERP system 1 preferably to the hard disk (external source) 2 of printing device(s) 30.

Preferably a GBIT-LAN connection is used for a short transmission time. The file format is described below.

During production, the image files are preferably buffered in TIF format and the job file is preferably buffered in CSV format on storage device 20 of system 1. A controller software of the processor 10 reads the data of the image files and the job file and instructs the printing device 30, in particular a Gamma 70 inkjet printer, to print the products 100. In addition, the controller software of processor 10 controls the camera electronics of testing device 40 and the UV control of a UV dryer for drying the printed products 100. As an additional function, the testing device 40 has a log function which creates log files preferably in ASCII format with the suffixes .ok, .nok, .log for production. Post-production can be initiated manually after evaluating the log files.

After processing on the printing machine 30, a production protocol for the ERP is preferably required, which is compared against the order.

Cutting and enveloping machine

- Preferably several bar code readers in the enveloping system record the bar code and compare it against a default file of the ERP. All bar codes that are not part of the default file are - like illegible bar codes - preferably rejected as bad and do not get into the (not shown) enveloping machine.

Precision conveyor belt

As shown in Fig. 2C, the conveyor belt 45 connects the components of system 1 and preferably has the following non-restrictive features:

- 10 (1) Suitable for the transport of products 100 for "process colour" colour printing
- (2) Support rollers 50 for flattening the folds
- (3) Radii at infeed and outfeed for infeed and destacking
- (4) Container 60 for the products 100 at the infeed and outfeed
- (5) Aligning edge 70 for guiding the products 100
- 15 (6) Product sensor 80 at infeed
- (7) Cover hoods without safety switch. The cover hoods are closed at the front and at the sides.
- (8) Speed is manually adjustable preferably from 10 m/min to 24 m/min
- (9) The working height of the conveyor belt 45 is preferably 1024 mm.
- 20 (10) The machine preferably runs from left to right

Ionising unit

The ionizing unit is preferably used for the static discharge of the products 100 and for a better printing result and possibly less cleaning effort.

25

Gamma 70 colour printer (as an example of the printing device 30)

|                     |                                     |
|---------------------|-------------------------------------|
| Print width         | 70 mm                               |
| Printing speed      | max. 24 m/min                       |
| Resolution          | 360 x 360 dpi                       |
| 30 Ink colours      | CYMK (Cyan, Yellow, Magenta, Black) |
| Ambient temperature | 20°C - 30°C                         |
| Minimum font size   | 4 pt (DIN 16507-2) / 1 mm           |
| Layout spacing      | min. 2 mm                           |

|                                  |                         |
|----------------------------------|-------------------------|
| Printhead to product distance    | 0.5 - 2 mm              |
| Ambient temperature              | 15 - 40°C               |
| Humidity                         | 10 - 60% non-condensing |
| Maximum altitude above sea level | 2000 m                  |

5

The head holder of the printer allows:

- Printhead adjustment option to lift the printhead for cleaning. If there is no nozzle output in the print image, manual cleaning is preferred.

#### 10 SmartCure UV Dryer

|                          |                           |
|--------------------------|---------------------------|
| Drying width             | max. 75 mm                |
| Drying capacity          | 4, or 8 W/cm <sup>2</sup> |
| Wavelength               | 380 - 420 nm (UV-A)       |
| Dryer – product distance | 1 - 5 mm                  |

15 Ambient temperature 15 - 40°C

Humidity 10 - 90% non-condensing

The UV dryer is preferably equipped with a cooling unit and control unit, which can be installed next to the transport machine, for example.

20

#### Camera 40 (as an example of the testing device 40)

The camera 40 preferably includes lighting, mounting, evaluation electronics and software and a control screen for reading back the bar code or, if necessary, the plain text digit.

25 Maximum field of view of the camera 40 = 53 mm x 85 mm.

For the layout described below, the bar codes can be read via sub-triggers. If the bar codes or bar code arrangements (layout definition) change, a new camera job and position will preferably be set up for this change. This also applies to corresponding post-processing systems (e.g. reading at the cutting machine).

30

#### Control cabinet / Hardware

The control cabinet preferably comprises a screen with keyboard and mouse function at the transport table.

The controller hardware should preferably be placed free next to the housing of the colour printer 30 and should preferably include:

- (1) A separate LAN card to integrate system 1 into an external LAN backup
- (2) ("Acronis") hard disk drive.

5 With reference to Fig. 3, the software and formats used are described below.

#### Controller software

As shown in Fig. 3, the software preferably has the following non-restrictive features:

- (1) The print position can be adjusted by the operator in the running direction on the  
10 controller 10 via software within a range of +/- 5 mm.
- (2) The controller software can create 3 types of log files:
  - a) all products 100 that were rated ok by camera 40 (\*.ok)
  - b) all products 100 that were rated as not OK (nok) by camera 40 (\*.nok)
  - c) all products 100 that were rated ok and nok by camera 40 (\*.log)

15

#### Layout software for the printing device 30 (e.g. Gamma 70)

The layout software allows the definition of a layout description. The following features are preferably important for the application:

- (1) Variable background image (described below in Fig. 4, reference 1001)
- 20 (2) Variable images / text image (described below in Fig. 4, reference 1002)
- (3) Variable texts that can be displayed in different fonts and font sizes
- (4) Variable fields in which ASCII information can be represented in a bar code e.g. 2/5 interleaved or DataMatrix Code ECC200.

The layout is preferably provided before the start of production of the controller software.

25 During production, the variable fields are filled with data from the CSV file and printed.

#### Functional sequence

##### Work preparation

In work scheduling, a layout (\*.DSN) is preferably defined for the individual products 100  
30 in a stack. The CSV file for a batch is generated. The images required for a batch are generated and stored in the agreed resolution and format.

The generated files are copied to the agreed directories of the production computer.

### Start of the system 1

The operator switches on the system and cleans the colour printer 30 (optional).

The beginning of a stack (of information carriers 100) is inserted into the physical transport. The operator selects the job (= predefined parameter set) in the software.

- 5 There is preferably only one job, since all products are processed in the same way and preferably use the same layout.

The controller software loads the layout and the colour correction profile according to the definitions stored in the job. The operator then selects a CSV file (set of elements; references) and brings the controller software into production readiness.

- 10 The operator starts the physical transport. The start button is preferably located at the output of system 1, so that the operator can correctly place the start of the belt without stopping the machine. A speed potentiometer preferably allows the reduction of the approach speed, if the insertion at full speed is too difficult. This process avoids a spelling misalignment.

15

### Uninterrupted production

The products 100 (information carrier 100) are pulled from the carton into the transport. Before the products 100 reach the conveyor belt 45, a print mark (not shown) is preferably detected from below. The product path is fed under the printer 30. The controller software

20 has recognized the print mark and reads the image files referenced in the CSV file for each product and sends the associated product variable bar code and plain text information to the colour printer 30.

The colour printer 30 prints. The subsequent UV dryer cures the ink. The camera 40 preferably takes a picture of the bar code and delivers a reading result to the controller.

- 25 The camera 40 verifies the bar code as good and therefore system 1 continues to run normally.

### End of production

- 30 When the CSV file is completely processed, a machine stop is triggered as soon as the last printed product 100 has arrived at the output of the machine.

Fig. 4 shows a printed information carrier 100 that has passed through the system according to the invention. The carrier 100 includes a background image 1001 based on a background image file, a foreground image ("overlay") 1002, and optional variable data

1003, such as bar codes.

Properties of unprocessed products 100 (as an example, the information carrier 100) stacks

- 5 Stacks of 3,000 or 4,500 individual products 100 each are fed into the machine. The stacks preferably consist of Z-folded and perforated tickets (information carriers 100) for events. The perforation and folds are preferably located on the narrow sides of the stack. A stack is preferably approx. 300 mm high (for 3,000 tickets 100 approx. 406 mm) and for 4,500 tickets 100 approx. 609 mm long. In a stack of 3,000 single products 100 it is possible
- 10 that the perforation is separated and the stack consists of 2 partial stacks.

Single product 100 (as example of information carrier 100)

The products to be processed 100 preferably have the following properties:

|    |                                       |                                                                                                                                                                                                                                   |
|----|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15 | Width, length                         | 82 mm x 203 mm (running direction)                                                                                                                                                                                                |
|    | Paper weight                          | 175 g/m <sup>2</sup>                                                                                                                                                                                                              |
|    | Print mark                            | Black in white background 15 mm x 10 mmv(running direction) on the <u>back</u> of the individual products. The print mark is preferably always in the same position. The minimum size of the print mark is preferably 8 mm x 8 mm |
| 20 | Contrast                              | The contrast between the print mark and the background print is preferably > 200 greyscales with a scale of 256.                                                                                                                  |
|    | Surface tension                       | The print quality can preferably be classified as good without surface treatment.                                                                                                                                                 |
| 25 | Background printing on the front side | white                                                                                                                                                                                                                             |

Production information

Production option 1

- 30 The bar code information 1003 is integrated into the overlay 1002 by the information provider. The print quality at printer 30 is then preferably optimised in such a way that the desired print quality is also achieved for the bar codes.

Alternatively, the bar code information 1003 is supplied separately and added at fixed

positions (incl. variance value).

Example:

[Ticket]: 007054877401 (identifier)

[Background]: 0, 0, 0000005320(++).tif (background image file 1001, reference)

- 5 [Text overlay]: 0, 0, 0000005320(++).tif (foreground image file 1002, reference)

### Production option 2

The bar code information 1003 is preferably delivered separately and added at variable positions.

- 10 File format of the data supplied by the information provider: [Ticket] : <TicketID> (identifier)

[bar code]: <Size>, <XPos>, <YPos>, <Typ>, <Rotation>, <Alignment>, <bar code>

[Background]: <XPos>, <YPos>, <Filename> (background image file 1001, reference)

- 15 [Text overlay]: <XPos>, <YPos>, <Filename> (foreground image file 1002, reference)

The control file will preferably contain up to 5 lines per ticket 100, the labels "ticket", "background" (not applicable for standard tickets) and two times the label bar code once for the ACC bar code and once for the TicketID.

- 20 Example:

[Ticket]: 007054877401 (Identifier)

[Background]: 0, 0, 0000005320(++).tif (background image file 1001, reference)

[Text overlay]: 0, 0, 0000005320(++).tif (foreground image file 1002, reference)

[bar code]: 38, 90, 570, 0, 270, 4, 005240498600100050011000

- 25 [bar code]: 38, 1130, 740, 2, 360, 8, 007054877401

If the background is not correct, an empty default file is preferably sent. If no bar codes are available, the bar code would preferably be empty (e.g. "[bar code]: 38, 1130, 740""").

- 30 The two bar code positions within the file can vary per ticket 100, the position of the remaining fields is determined with the first test file. The file is a comma separated \*.txt file (or CSV file).

According to the invention, a background image 1001, a superimposed text image and the bar codes are printed. This allows the tickets to be designed creatively.

In other words, the image data includes two image files (background image 1001/overlay 1002). The overlay 1002 preferably consists of any number of elements (e.g. font, characters, smaller image files (logos etc.)) and is preferably created externally in advance. The background image file 1001 preferably has a resolution of 360 x 360 dpi for a given ticket size and is up to 12MB in size, whereas the overlay image file 1002 preferably has a resolution of up to 6MB. System 1 superimposes the two image files - first background 1001 then overlay 1002 - and then prints the resulting overall image.

The definition file or control file preferably contains per line the information for the creation of a ticket 100, as well as a reference to the overlay image file and the background image file. The total file for a ticket job of 3,000 tickets 100 therefore preferably contains 9,000 lines.

The production computer preferably uses both picture elements 1001 and 1002 per line and generates a common picture from them. Preferably, the font from overlay file 1002 is inverted with a dark background image 1001, i.e. the material is not printed in the area (no white print) and the actual ticket material (white paper) creates the font, since the surrounding areas are printed. Alternatively, the font from overlay file 1002 black (e.g. CMYK) is printed preferably for a bright background image. Thus, preferably completely variable tickets 100 with changing information (overlay file 1002) and background images 1001 can be printed.

In an embodiment, the rows of the CSV file contain the following columns:

|    |                                         |                                                                                                                                                   |
|----|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 1) | Ticket ID                               | Alphanumeric Numeric 0 to 9                                                                                                                       |
| 2) | Bar code information 1                  | Currently Numeric 0 to 9. maximum 24 characters. The bar code information preferably encodes the event and, if applicable, the seat and the like. |
| 3) | Bar code information 2                  | Currently Numeric 0 to 9, maximum 12 characters. The bar code information preferably encodes the event and, if applicable, the seat and the like. |
| 4) | Reference to Background image file 1001 | File name of the background image file (e.g. BruceSpringsteen26062012_1900_Berlin.tif)                                                            |
| 5) | Reference Text Image (Overlay) 1002     | File name of the variable image file (e.g. ABCD000001_BruceSpringsteen.tif)                                                                       |

The data transfer of the image files takes place with a production essentially without loading pauses. During the processing of a print job, another print job is loaded into the production computer, where the execution of the print has priority. A job that has already been completed can be deleted with the lowest priority, i.e. the processes preferably  
 5 work in parallel and there are no production waiting times as a result of print preparation, loading or deleting jobs.

Parallel to the current printing processes, the print server will read in new job data during printing (e.g. up to 4,500 tickets per batch again) and move or delete the printed files. The controller 10 preferably deletes the files, as they are still available on the external source  
 10 2 or can be archived there for reprint functions etc. In order not to have any restrictions due to data access times in addition to the prioritization for the controller 10, 2 or more SSD hard disks are preferably provided so that the aforementioned processes can be processed in parallel. Thus the files are only stored once and are accessible on the external storage medium 2.

15 The controller 10 will preferably control the printer 30 with priority 1 in relation to its computing capacity, load (or fetch) new ticket data with priority 2, and move or delete the printed ticket data with priority 3. Files / print jobs are preferably archived externally. Reprints are controlled from the archive.

## 20 Other input

(1) Ink UV-curing, CMYK, for printing device 30.

## Output of the system

### Printing

As shown in Fig. 4, the individual products 100 are finally printed with the respective  
 25 images 1001, 1002 referenced in the CSV file.

In variable areas, a variable bar code 1003 and, if necessary, a plain text digit is printed.

The data in the CSV file was used for bar code 1003 and, if necessary, plain text digit.

The bar codes 1003 are preferably located in the field of view of the camera 40 in order to be read with only one camera 40 (as described above).

30 The tickets 100 are preferably provided with a margin of approx. 1 mm at the beginning and end, as well as at the top and bottom, so that the images and/or bar codes 1003 to be printed do not overlap on another image and the required layout spacing is maintained.

|    |                            |                                                                                                                                                                                                  |
|----|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5  | Bar code type              | Preferably 2 of 5 interleaved and Code 128                                                                                                                                                       |
|    | Bar code 1 size            | Preferably at least 27 mm x 8 mm (including plain text) – for 12 numeric characters (code 128)                                                                                                   |
|    | Bar code 2 size            | Preferably at least 12 mm x 45 mm (including plain text) - for 24 numeric characters (2 out of 5 Interleaved)                                                                                    |
|    | Bar code quality           | The quality of the bar codes depends on the substrate, size and other conditions (e.g. quiet zones).                                                                                             |
|    | Bar code colour            | The bar code is preferably printed in black.                                                                                                                                                     |
| 10 | Bar code background colour | The background colour of the bar code is preferably white. Space for the quiet zones of the bar code is preferably taken into account. Quiet zone = min. 10 x module width, but at least 2.5 mm. |

#### 15 Camera testing

The bar code and plain text digit have been checked for legibility as described above.

#### Output stack

The processed products 100 are preferably designed as Z stacks. The first 3 products 100 of a stack may remain unprinted (variable) if this is necessary for feeding reasons.

#### 20 Production information

A file of all tested individual products 100 is created in CSV format. Alternatively, the CSV file described above can also be supplemented.

|    |    |                      |
|----|----|----------------------|
| 25 | a) | Computer date        |
|    | b) | Computer time        |
|    | c) | Operator             |
|    | d) | Bar code information |
|    | e) | Camera reading       |
|    | f) | Good-bad flag        |

30 The file name corresponds to the input CSV file. The file extension is "OK" or "NOK" depending on the test result of the camera 40.

System performance

5

|                                     |           |
|-------------------------------------|-----------|
| Printing accuracy / Repeat accuracy | +/- 1mm   |
| Max. paper speed                    | 24 m/min  |
| Max. products per time              | 118 1/min |

Fig. 5 shows a procedural aspect of the device according to the invention. The procedure for controlling system 1 according to the invention comprises the following steps.

In a step S1, the method comprises storing, for each one of the plurality of information carriers 100, an individual set of information, and a step S2 storing a sequence of elements for each one of the plurality of information carriers 100, wherein each sequence has a reference to the corresponding individual set of information.

The following steps are carried out within a predefined time period t :

- step S3 of fetching, for a single information carrier 100, the corresponding reference from the storage device 20,
- steps S4a of fetching and S4b of arranging, for the single information carrier 100, the corresponding set of information from the storage device 20 by means of the reference,
- step S5 of instructing a printing device 30 to print the single information carrier 100 with the fetched and arranged set of information,
- and step S6 of waiting for completion of the printing operation.

Special situations in production

Special situations or exceptional cases and their treatment are described below.

25

Print mark not detected

If the print mark (on the underside of the information carrier 100) has not been detected, no print is triggered and an unprinted single product 100 is created by system 1. Due to the non-existent bar code 1003, this product 100 is automatically ejected in the enveloping system after the cutting process.

30

Camera 40 classifies the bar code as bad

The negative result of the camera 40 leads to a machine stop. All products 100 detected

by the product sensor 80 are processed normally, then the system 1 stops. The user should preferably manually invalidate the product 100 with the negative camera result as well as all subsequently processed products 100 by making the barcode 1003 illegible, e.g. by a pen.

- 5 The user checks the products 100 and cleans the printer 30 if necessary. The user preferably sets the file pointer of the CSV file to the product 100 (e.g. the identifier or ticket ID) that was read poorly and continues with production.

As the invalidated tickets 100 and unprocessed tickets 100 are automatically ejected in the enveloping system after the cutting process, the preferred tickets 100 are transferred

- 10 to the enveloping machine "strictly in sequence".

#### Operator detects printing errors in the image

If the operator detects faults in the image itself (which have not been detected automatically), it is preferable for the operator to stop the printing machine 30 and  
15 correct the problem. For better recognition of the quality of the printed image, the camera system which reads the bar code 1003 in the printing system is preferably used and the camera image is displayed on a separate screen, preferably with a clear magnification, which also shows parts of the printed image in addition to the bar code 1003.

- 20 The operator removes the physical misprints or damaged single products 100. The products 100 that are now missing in the output stack are preferably sent to the printing machine 30 again, e.g. from the ERP as files.

Alternatively, as described above, the products 100 can be cancelled and reprinted by moving the file pointer in the CSV file. In this way, the products 100 remain "strictly in

- 25 sequence" and can be transferred to the enveloping machine.

#### Product end before file end

If the last physical product 100 of a stack was produced, then the controller 10 does not receive any further product triggers and no longer prints.

- 30 The operator stops the machine and creates new raw products and restarts the machine. The first product trigger triggers the first print with a stretch delay.

A forward run (empty ticket 100) is always possible, since the deposit is made manually, for example.

File end before product end

The printing machine 30 moves the last product to the end of the printing machine 30, so that the operator can tear off 100 after the last printed single product.

- The printed products 100 come into the output stack, the unprinted products can be used
- 5 for a new batch (new file or sequence of elements).

**List of references**

|    |      |                                                                |
|----|------|----------------------------------------------------------------|
|    | 100  | Information carrier (product, ticket)                          |
|    | 1    | System                                                         |
| 5  | 2    | Hard disk (external source)                                    |
|    | 10   | Processor (Controller)                                         |
|    | 20   | Memory device                                                  |
|    | 30   | Printing equipment (printer, printing machine, colour printer) |
|    | 40   | Testing device (camera)                                        |
| 10 | 45   | Conveyor belt                                                  |
|    | 50   | support rollers                                                |
|    | 60   | Container                                                      |
|    | 70   | Aligning edge                                                  |
|    | 80   | Product sensor                                                 |
| 15 |      |                                                                |
|    | 1001 | Background image                                               |
|    | 1002 | Foreground image                                               |
|    | 1003 | Variable data, bar code                                        |
| 20 | t    | Time span                                                      |
|    | S1   | Save                                                           |
|    | S2   | Save                                                           |
|    | S3   | Fetch                                                          |
|    | S4a  | Fetch                                                          |
| 25 | S4b  | Fetch                                                          |
|    | S5   | Instruct                                                       |
|    | S6   | Wait                                                           |

**Patentkrav**

**1.** System (1) til at printe en flerhed af informationsbærere (100) med et individuelt sæt af information, omfattende:

- 5           en lagerindretning (20) der er indrettet til:
- at gemme et individuelt sæt af information for hver en af flerheden af informationsbærere (100); og
  - at gemme en sekvens af elementer for hver en af flerheden af informationsbærere (100), hvor hver sekvens har en reference til det
- 10           tilsvarende sæt af information;
- en printindretning (30), der er indrettet til at printe det tilsvarende sæt af information på hver af informationsbærerne (100);
- en testindretning (40), der er indrettet til at sammenligne en individuel informationsbærer (100) med det tilsvarende sæt af information,
- 15           en processor (10), der er indrettet til at gøre følgende inden for et foruddefineret tidsrum (t):
- at hente den tilsvarende reference fra lagerindretningen (20) for en individuel informationsbærer (100),
  - at hente og arrangere det tilsvarende sæt af information fra
- 20           lagerindretningen (20) for den individuelle informationsbærer (100) ved hjælp af referencen;
- at instruere printindretningen (30) om at printe et hentet og arrangeret sæt af information på den individuelle informationsbærer (100),
  - at vente på afslutning af printprocessen,
- 25           - at instruere testindretningen (40) om at sammenligne de individuelle informationsbærere (100), og
- at vente på afslutningen af testprocessen,
- kendetegnet ved, at** informationsbæreren er en ticket, og at den ticket omfatter en adgangskontrolkode og en ticket ID-kode, og at en database-drevet konvoluttering udføres, hvor et enkeltarkprintsystem tilvejebringes,
- 30           hvilket er indrettet til at printe mindst en følgeseddel, især et brev med en postadresse;
- hvor en kombination af den mindst ene følgeseddel med mindst en af disse tickets (100) udføres, og hvor, om nødvendigt, kombineres adskillige

tickets (100) per forsendelse og/eller per konvolut, der skal sendes, med den tilsvarende følgeseddel og udstedes som en færdig forsendelse fra et konvolutteringssystem,

5 hvor systemet yderligere omfatter en skæremaskine med mindst to strejkodelæsere, hvor ticket ID-koden læses med et første strejkodelæsehoved og adgangskontrolkoden læses med et andet strejkodelæsehoved, hvor den læste ticket ID sammenlignes med en information fra en kontrolfil, og, hvis der ikke kan læses en ticket ID, at læse og sammenligne adgangskontrolkoden med en information fra

10 kontrolfilen, og, hvis ingen af de to strejkodeinformationer er læselige og/eller kan bekræftes korrekt, at trække den ticket med en læsefejl tilbage til manuel opfølgning med kontrol af konvolutterings-processen.

2. System ifølge krav 1, hvor sættet af information omfatter mindst to billedfiler.

15

3. System ifølge krav 2, hvor en første en af billedfilerne er en baggrundsbilledfil (1001) og en anden en af billedfilerne er en forgrundsbilledfil (1002), hvor baggrundsbilledfilen (1001) er identisk for alle af flerheden af tickets (100), og forgrundsbilledfilen (1002) er individuelt forskellig for hver af flerheden af tickets

20 (100).

4. System ifølge krav 3, hvor opsætningsprocessen udføres af processoren (10) på en sådan måde, at forgrundsbilledfilen (1002) lægges ovenpå baggrundsbilledfilen (1001).

25 5. System ifølge krav 3 eller 4, hvor printprocessen udføres af processoren (10) på en sådan måde, at forgrundsbilledfilen (1002) og baggrundsbilledfilen (1001) kombineres til et foruddefineret sæt af parametre.

30 6. System ifølge krav 5, hvor det foruddefinerede sæt af parameter er et printjob.

7. System ifølge mindst et af kravene 3 til 6, hvor mindst forgrundsbilledfilen (1002) tilvejebringes i forvejen fra en ekstern kilde (2).

**8.** System ifølge mindst et af kravene 3 til 7, hvor billedfilerne (1001, 1002) gemmes i et format valgt fra gruppen bestående af TIF-filer og PNG-filer.

**9.** System ifølge krav 8, hvor den mindst ene af billedfilerne (1001, 1002) er i  
5 komprimeret form.

**10.** System ifølge mindst et af de foregående krav, hvor trinnene at hente, hente og arrangere, printe og vente udføres under realtidsbetingelser under tidsrummet t.

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**11.** System ifølge mindst et af de foregående krav, hvor lagringstrinnene udføres separate fra trinnene af hente, hente og arrangere, printe og vente forberedende under realtidsbetingelser.

15 **12.** System ifølge mindst et af kravene 1 til 10, hvor lagringstrinnene udføres separate fra trinnene til at hente, hente og arrangere, printe og vente forberedende og ikke under realtidsbetingelser.

**13.** System ifølge mindst et af de foregående krav, hvor hver sekvens af  
20 elementer starter med en unik identifikator til at identificere den respektive ticket (100).

**14.** System ifølge krav 13, hvor hver sekvens af elementer indeholder referencen til sættet af information i form af et sti- og filnavn.

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**15.** System ifølge krav 13 eller 14, hvor sekvenserne af elementer gemmes i en fil i ASCII-format.

**16.** System ifølge krav 15, hvor filen gemmes i formatet Comma Separated Value,  
30 CSV.

**17.** System ifølge mindst et af kravene 3 til 16, hvor processoren (10) er indrettet til at gøre følgende under de aktuelle printingprocesser:

- at omdøbe hver individuel reference efter printprocessen er udført.

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**18.** System ifølge mindst et af kravene 3 til 17, hvor processoren (10) er indrettet til at gøre følgende under de aktuelle printprocesser:

- at hente fra lagerindretningen (20) for den næste flerhed af tickets (100) de respektive næste referencer,
- 5       - at hente og arrangere det tilsvarende sæt af information fra lagerindretningen (20) for den næste flerhed af tickets (100) ved hjælp af referencerne, og
- at vente på afslutningen af de aktuelle printprocesser.

10   **19.** System ifølge krav 18, hvor efter afslutning af de aktuelle printprocesser, konfigureres processoren (10) til at flytte det aktuelle sæt af information i lagerindretningen (20).

15   **20.** System ifølge krav 18, hvor efter de aktuelle printprocesser, konfigureres processoren (10) til at slette det aktuelle sæt af information i lagerindretningen (20).

**21.** System ifølge krav 19 eller 20, hvor processoren (10) er indrettet til:

- at udføre printprocessen med en første prioritet,
- 20       - at udføre afhentningsprocessen med en anden prioritet der er lavere end den første prioritet, og
- at udføre flytnings- eller sletningsprocessen med en tredje prioritet der er lavere end den første og anden prioritet.

25   **22.** System ifølge et af de foregående krav, hvor processoren (10) endvidere er indrettet til at gøre følgende inden for det foruddefinerede tidsrum t:

- registrere det komparative resultat i den tilsvarende sekvens af elementer.

30   **23.** System ifølge mindst et af de foregående krav, hvor denne ticket (100) fremstilles fra et enkelt papirark eller et kontinuerligt papirark.

**24.** Processor til anvendelse i et system ifølge mindst et af kravene 1 til 23 som en administrationsindretning.

**25.** Fremgangsmåde til at styre et system (1) til at printe et individuelt sæt af information på en flerhed af informationsbærere (100), omfattende trinnene:

- at gemme (S1) et individuelt sæt af information for hver en af flerheden af informationsbærere (100), og
  - 5 at gemme (S2) en sekvens af elementer for hver en af flerheden af informationsbærere (100), hvor hver sekvens har en reference til det tilsvarende individuelle sæt af information;
  - inden for et foruddefineret tidsrum (t):
  - at hente (S3) den tilsvarende reference fra lagerindretningen (20) for en
  - 10 individuel informationsbærer (100),
  - at hente (S4a) og arrangere (S4b) det tilsvarende sæt af information fra lagerindretningen (20) for den individuelle informationsbærer (100) ved hjælp af referencen;
  - at instruere (S5) en printindretning (30) om at printe det hentede og
  - 15 arrangerede sæt af information på den individuelle informationsbærer (100);
  - at vente (S6) på en afslutning af printprocessen.
  - at instruere testindretningen (40) om at sammenligne den individuelle informationsbærer (100) med det tilsvarende sæt af information, og
  - 20 - at vente på afslutningen af testprocessen,
- kendetegnet ved, at**
- informationsbæreren er en ticket, og at denne ticket omfatter en adgangskontrolkode og en ticket ID-kode, og at i yderligere trin udføres en database-drevet konvoluttering, hvor et enkeltarkprintsystem tilvejebringes,
- 25 hvilket er indrettet til at printe mindst en følgeseddel, især et brev med en postadresse;
- hvor en kombination af den mindst ene følgeseddel med mindst en af disse tickets (100) udføres, og hvor, om nødvendigt, kombineres adskillige tickets (100) per forsendelse og/eller per konvolut, der skal sendes, med
- 30 den tilsvarende følgeseddel og udstedes som en færdig forsendelse fra et konvolutteringssystem,
- hvor testprocessen omfatter trinnene:
- at læse ticket ID-koden med et første stregkodelæsehoved på en skæremaskine og at læse adgangskontrolkoden med et andet
- 35 stregkodelæsehoved på skæremaskinen, at sammenligne den læste ticket

5 ID med en information fra en kontrolfil, og, hvis der ikke kan læses en  
ticket ID, at læse og sammenligne adgangskontrolkoden med en  
information fra kontrolfilen, og, hvis ingen af de to stregkodeinformationer  
er læselige og/eller kan bekræftes korrekt, at trække den ticket med en  
læsefejl tilbage til manuel opfølgning med kontrol af konvoluterings-  
processen.

**26.** Computerprogramprodukt med programkodedele til at udføre  
fremgangsmåden ifølge det foregående krav, når computerprogramproduktet  
10 udføres på en eller flere computerindretninger.

**27.** Computerprogramprodukt ifølge krav 26, hvilket lagres på et  
computerlæsbart medie.

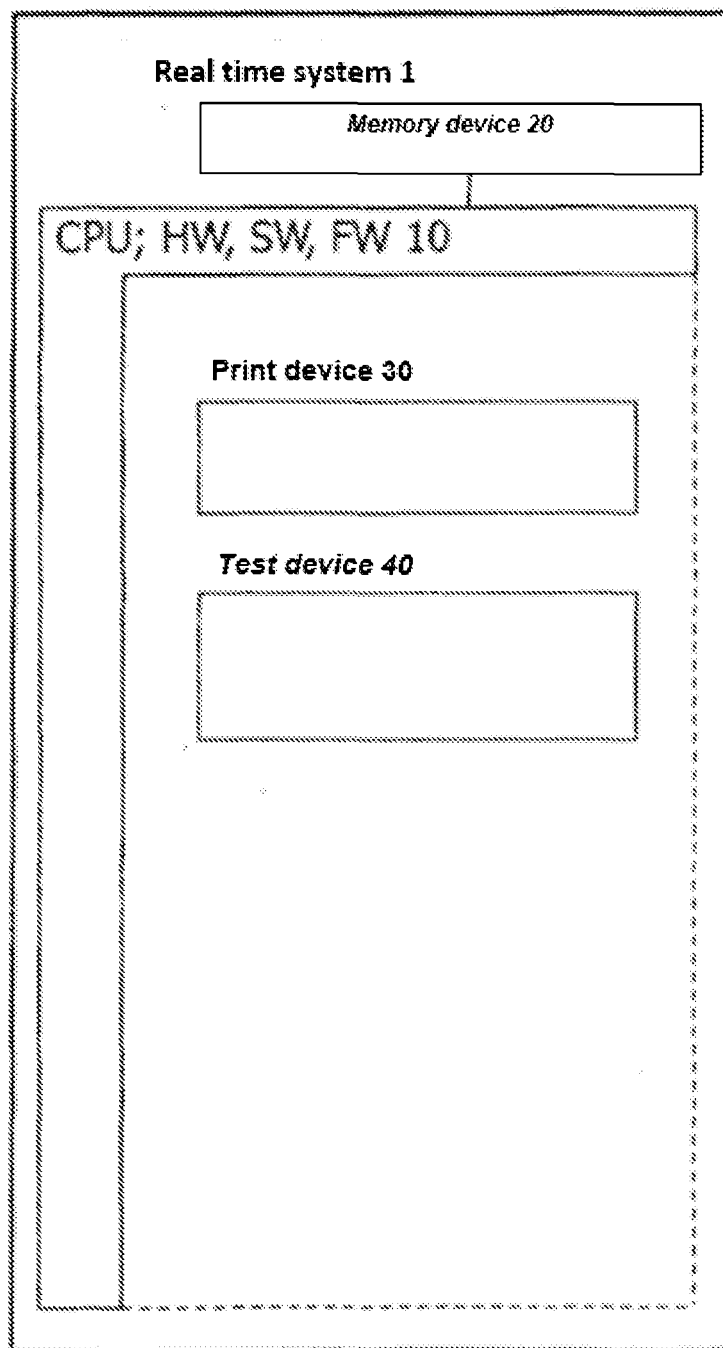


Fig.1

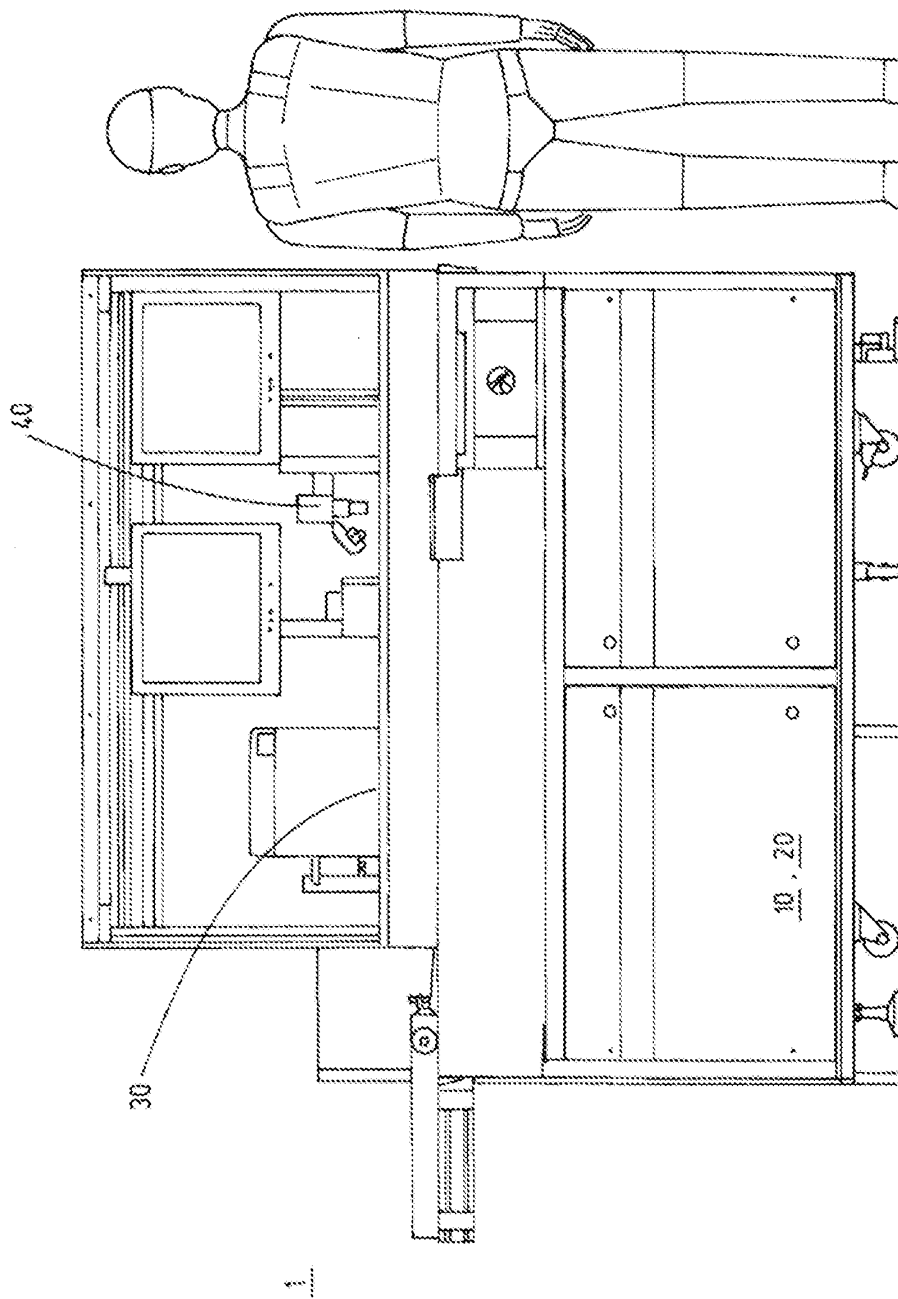


Fig. 2A

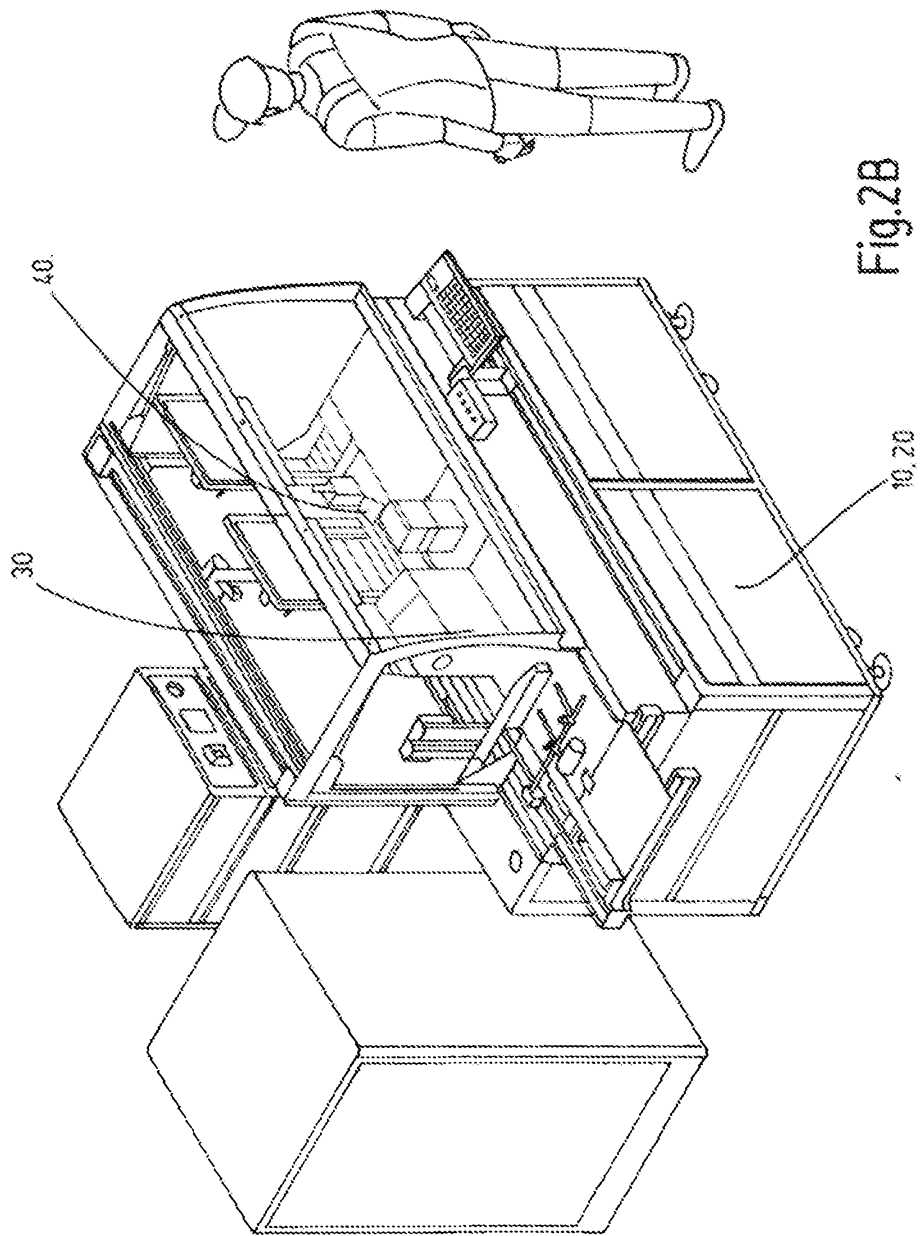
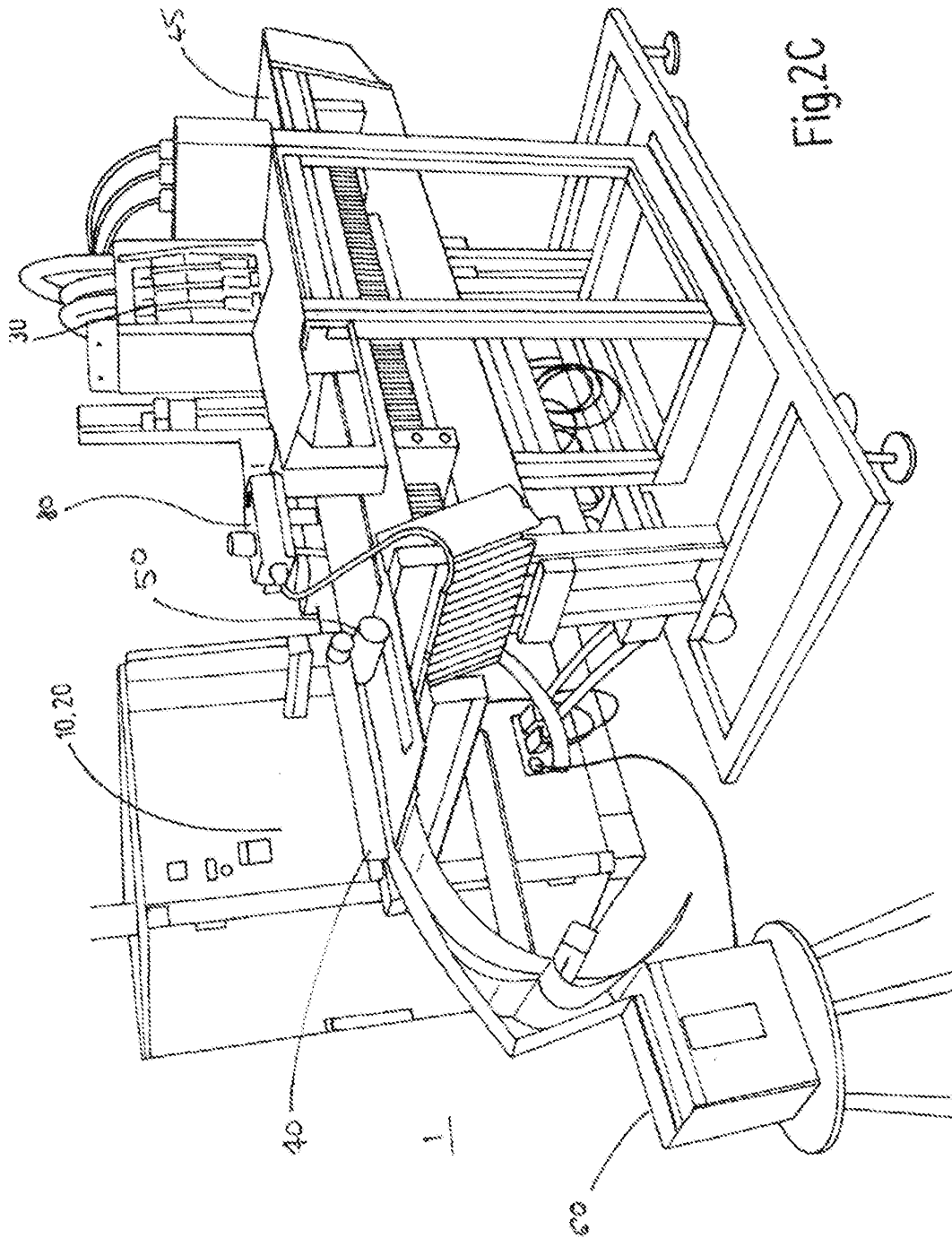
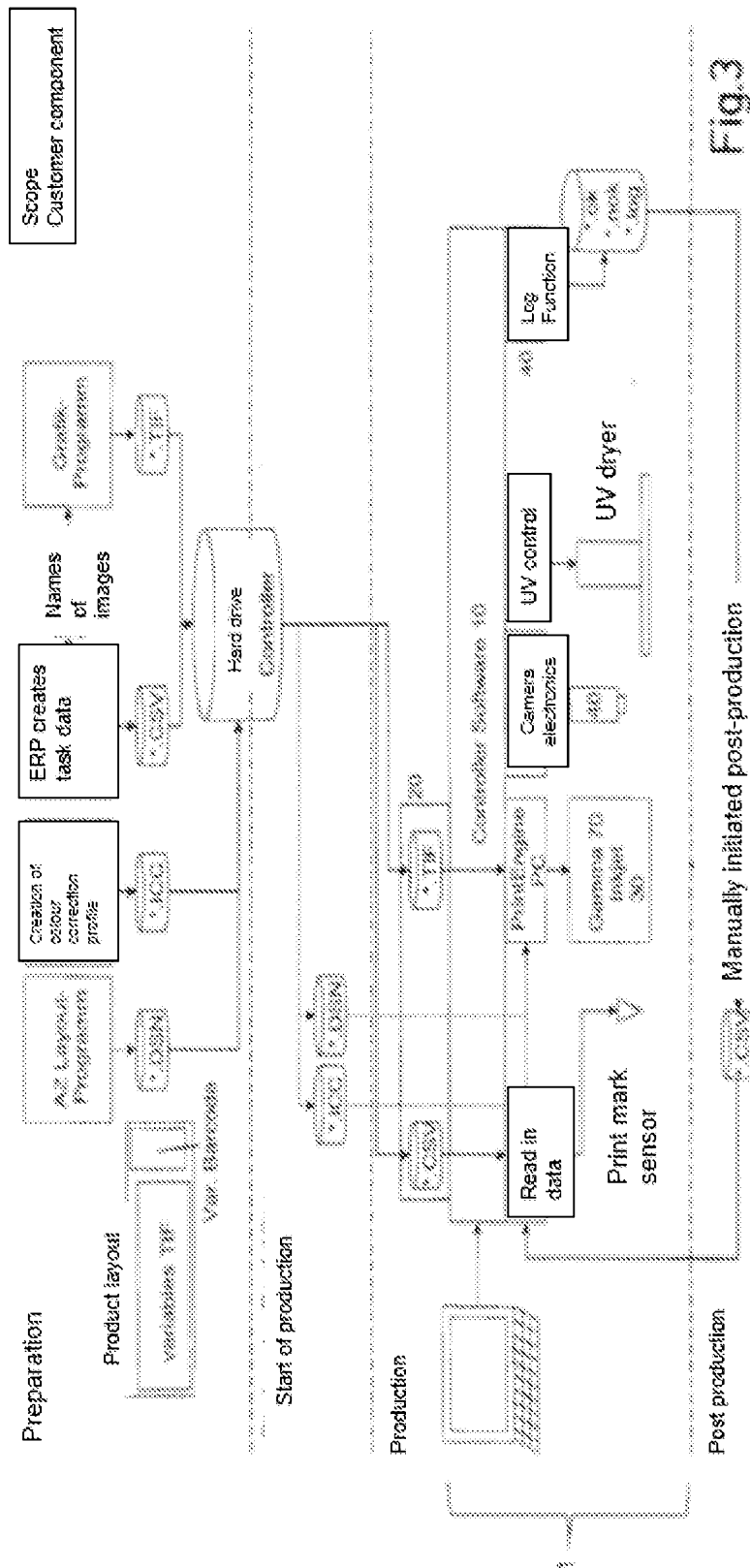


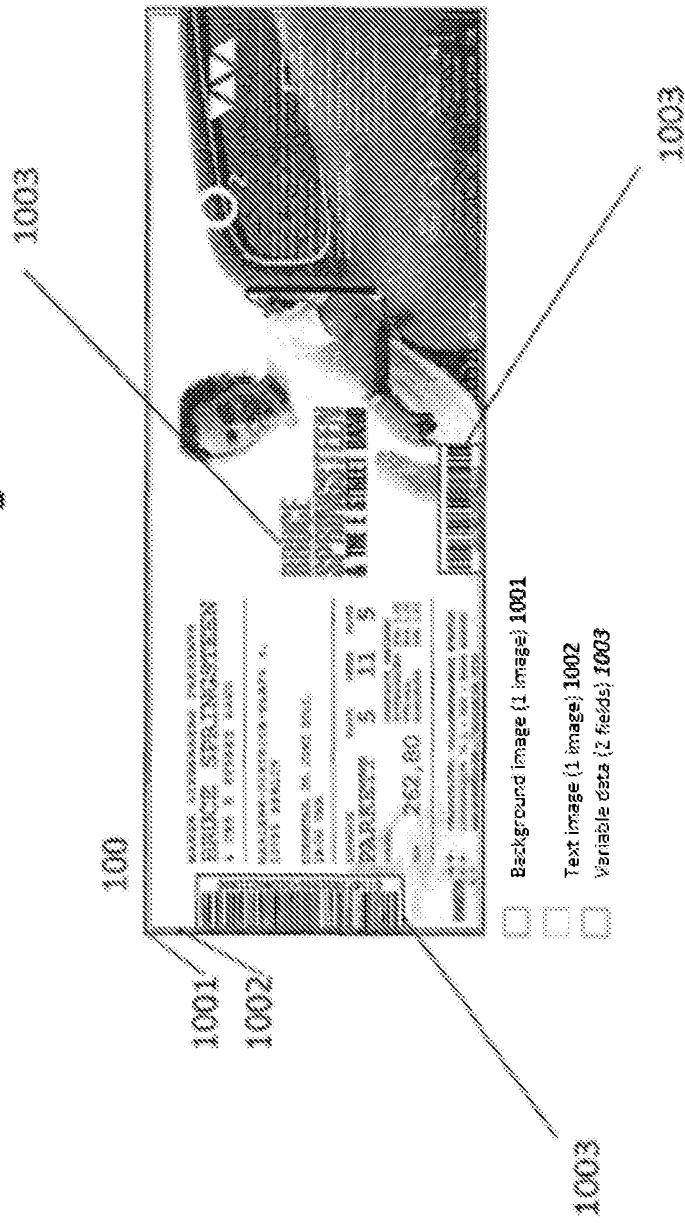
Fig. 2B



2019



20



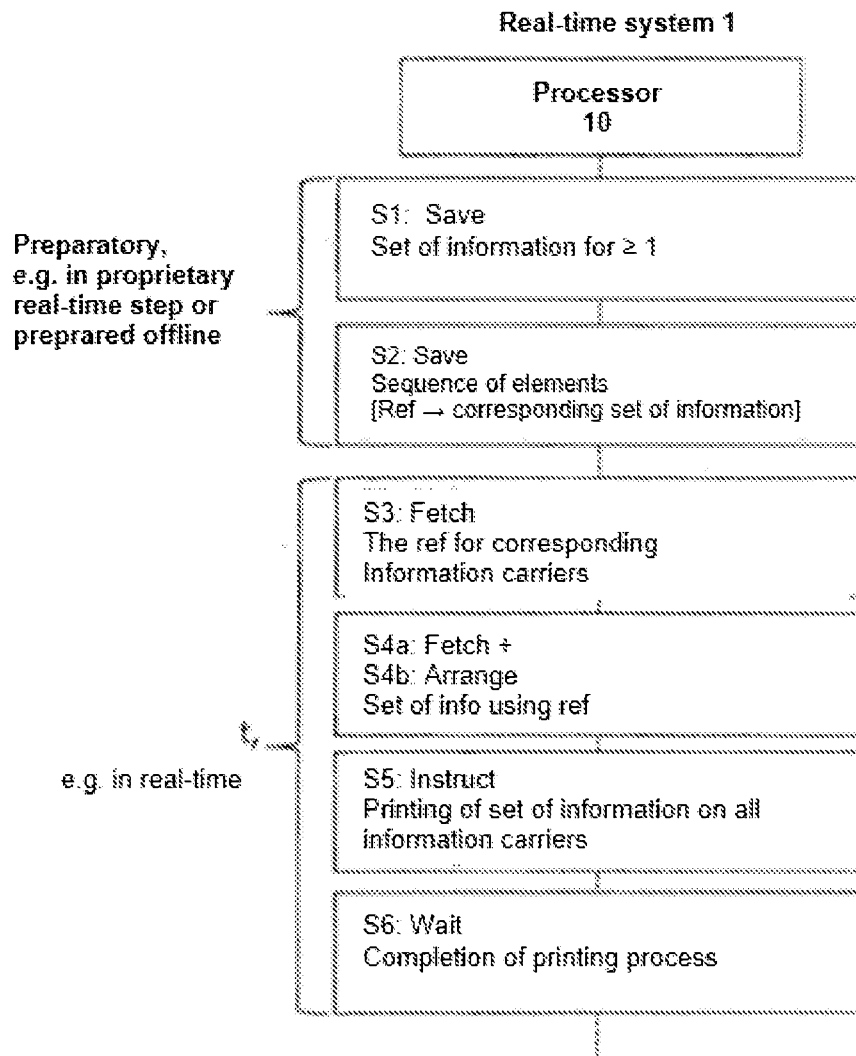


Fig.5