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(71) Applicant: **ECS S.r.l. EUROPEAN CONTRACT SERVICES**
Via Boccherini, 2
I-20081 Abbiategrasso (MI) (IT)

(72) Inventor: **Aosani, Roberto**
Viale Papa Paolo VI
I-20081 Abbiategrasso, MI (IT)

(74) Representative: **Giambrocono, Alfonso, Dr. Ing. et al**
Ing. A. Giambrocono & C. S.r.l.
Via Rosolino Pilo 19/B
I-20129 Milano (IT)

(54) **Method for reproducing inscriptions on containers directly on the packaging line, and the relative containers.**

(57) The invention relates to a method for reproducing inscriptions on containers of any form or type or on labels applied to them, directly on the packaging line. The desired inscription is thermally reproduced, directly on the packaging line, by laser or heated heads on a limited region of the containers which has been previously covered with a layer of thermosensitive recording material or ink, without danger of contaminating or damaging the containers, without requiring bulky equipment, and at a high reproduction rate.

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This invention relates to a method for reproducing inscriptions on containers directly on the packaging line, and also relates to the containers obtained in this manner and to the containers to be subjected to said reproduction method.

The containers concerned can be of the most diverse forms (large or small boxes, bags etc.), be constructed of different materials, and be intended to contain any product (in particular pharmaceutical or food products).

Inscriptions such as words or dates often have to be reproduced either on containers or on labels applied to them, directly on the machine or line on which the products to be contained in the containers are fed into them or on which the final packaging of the containers takes place.

For example the expiry date, or price, or a series number has to be reproduced on containers for drugs or food products, such data not being able to be determined much beforehand and hence not being able to be printed when the containers are initially printed and prepared by the paper processing firm.

The aforesaid inscriptions (which as stated have to be reproduced on the line or plant in which the containers are filled or packaged) are currently reproduced by ink jets sprayed onto the boxes, or by printing by ink applied by an inked printing head, or by dry punches which locally deform the containers to leave the desired impression on them, or by applying labels previously printed with the desired inscription to such containers.

All these methods have considerable drawbacks, such as a relatively high cost, a slowdown in the container packaging rate, the need to position (to the side of the packaging line) ink-containing vessels or printing or punching machines which are costly and space-consuming, or the danger that the inks used and in particular their volatile solvents contaminate the products contained in the containers, etc.

The main object of the present invention is to provide a method which enables inscriptions to be reproduced on containers at high speed and at low cost directly on the packaging line, while avoiding the danger of contaminating the products contained in the containers, the risk of mechanically damaging the containers or the products contained in them, and the risk of contaminating such products, and in all cases without requiring the use of bulky equipment positioned to the side of the packaging line.

These and further objects are attained by a method in which on a limited region of the containers which has been previously at least partly covered with a layer of thermosensitive recording material or ink, inscriptions or the like are reproduced directly on the container packaging line by thermal means which heat said recording material in correspondence with the desired inscriptions.

Thermosensitive recording materials or inks are well known. When heated they irreversibly assume a colour or tone different from the original (such recording materials can be transparent or white or coloured before heating). Recording material or ink compositions of the aforesaid type are described in many patents, for example in US-A-4742042, US-A-5043313 and DE-A-3836797, and are manufactured by numerous firms such as Pilot Ink (Japan), Big Three Industries Tempil Division (USA), Jin An Industrial (Taiwan), Manoukian S.p.A. (Italy), etc.

Such recording materials or inks can be applied to the containers in many different ways, for example by brush, by spraying, or by printing machines. It has however been found particularly advantageous to directly use those machines commonly used for applying liquids or fluids under pressure to paper supports or the like, employing spray guns or spreading heads of well known type such as those manufactured by Nordson Corporation (USA) or by Robatech (Italy) - commonly used for spreading glue over cardboard blanks or over packages of various types. Using these systems on a common machine of known type for folding and gluing boxes, it is possible to apply over limited regions of the boxes a layer of thermosensitive recording material or ink at a rate of about 100,000 boxes per hour (or more).

The layer of thermosensitive recording material can be applied directly by the paper processing firm which prints and produces the boxes, or by the label production firm (if the desired inscription is to appear on a label), or by the firm which produces and supplies the containers (sachets, bags or the like). This can be done very easily because such firms already possess the machinery for applying the layer of thermosensitive recording material, which application can be effected directly before or after the normal printing of the cardboard blanks (or resistant structure) of the containers or during the container folding. If desired, the layer of thermosensitive recording material can be applied during any stage of the manufacture of the containers, but before printing the inscriptions.

The firm which uses the containers, feeds into them the products to be contained, and then closes the containers, has merely to position at any point of the packaging line a heated head or a laser beam source to heat the layer of thermosensitive recording material (at a rate which can be very high) at the points at which the desired inscription is to appear. As will be apparent, the overall size of such heating members is very small, there are no problems of contaminating or damaging the containers or their contained products, and final container packaging cost and time are reduced.

It is not necessary to describe the laser beam sources or heated heads for reproducing the inscriptions on the layer of thermosensitive recording material as their construction is simple and obvious to any expert of the art.

The invention also relates to containers with inscriptions reproduced in the described manner on layers of thermosensitive recording material, and also to containers with limited regions covered with a layer of such recording material and intended to receive the said thermally printed inscriptions directly on the container packaging line.

Claims

1. A method for reproducing inscriptions on containers directly on the packaging line, characterised in that on a limited region of the containers which has been previously at least partly covered with a layer of thermosensitive recording material or ink, inscriptions or the like are reproduced directly on the container packaging line by thermal means which heat said recording material in correspondence only with the desired inscriptions.

2. A method as claimed in claim 1, characterised in that said thermal means are laser beams.

3. A method as claimed in claim 1, characterised in that said thermal means are heated profiled heads.

4. A container comprising a region at least partly covered with a layer of thermosensitive recording material or ink on which inscriptions are reproduced thermally.

5. A container comprising a region at least partly covered with a layer of thermosensitive recording material or ink which is to thermally receive inscriptions on a container packaging line.