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(54) Labelling machine for mass-labelling of packages of different sizes and shapes

Etikettiermaschine für grosse Mengen von Verpackungen unterschiedlicher Form und Grösse

Machine pour l'étiquetage en grande quantité d'emballages de différentes tailles et formes

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GB-A- 1 402 179 **GB-A- 2 078 668**
GB-A- 2 092 095 **US-A- 3 888 725**

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Description

The object of the present invention is a labelling machine, integrated into a products labelling line, provided with a long-distance label thrower by air jets and a fine regulation, that throws the label and guides it from the head of the thrower to the package on the conveyor belt.

This pneumatic throw and guidance takes up great differences in the dimension of the packages, not only in consecutive blocks of packages of different sizes but also in alternate blocks of packages with diverse sizes and irregular shapes.

For this purpose the blow-out system, incorporated to the label uncoiling system in the head of the labelling machine, is provided with a pneumatic conduction connected to a nozzle-holder, as well as several nozzles prepared for the pass of the air jets, joined to a plate situated in front of the label tape, producing short blows on certain points of the label, in a programmed and timed way.

The device also has an extractor that equilibrates the pressure of the system, and when the label tape passes in front of the plate, it absorbs it and holds it there so that they can be thrown by the air jets from the nozzles, sticking them to the packages.

There are lots of labelling machines, from the simplest hand-operated ones to the automatic ones integrated at the end of a production and labelling line.

In the group of the automatic labelling machines there are also different systems: from the gluing machines to the more modern ones which incorporate a feed reel for a label tape and different means to stick them on the packages.

With reference to the automatic machines, we mention the patents that include a label tape and with a system based on a rotating arm to stick the label on the package, generally visually and manually assisted to save the differences in height of the consecutive packages.

We mention, for example, patent no. D89402860 denominated 'Improved Labelling Machine'.

The other patent we mention is no. P8802837, denominated: 'Portable Automatic Labelling machine' that incorporates a sensing arm that detects the position of the individual package to be labelled in order to regulate the labelling rate.

Document US-A-3 888 725 discloses a labelling machine in accordance with the preamble of claim 1.

In spite of the improvements described, there is not any machine in the market that programmes, times and sticks the labels at a long distance, without any assistance, by no mechanical means and for packages of any shape and size, as for example the labels of weights and prices for the great variation of products sold in great commercial centres.

The object of the present invention is to improve the prior art machines in order to obtain a reliable labelling of packages presenting various sizes and shapes.

This object is attained by the invention as defined in the appended claims.

The solution proposed consists of a labelling machine for different packages in continuous line, provided with mechanical means to drive and uncoil the label tape.

This tape is driven into a box with an extraction ventilator that creates a vacuum next to the tape, acting as an aspirator of one of the labels on the tape.

As a result of this vacuum generated by the blowing out of the ventilator, the label adheres on its non adherent side to a plate with a series of holes with a diameter and arrangement appropriate for the object of the present invention, covering the surface of these holes according to the size of the usual labels of the user.

In front of these holes and on the other side of the plate where the label is adhered, there are several nozzles for the air blown out by an external impulsion device, programmed and timed according to the labelling rate and the characteristics of the packages.

Given the functional characteristics of both air systems, one continuous and the other one intermittent, there is a double circulation of air through the holes of the plate: the aspiration, that occupies alternatively the whole hole or the peripheric zone, and the impulsion, intermittent and that occupies the central zone of the hole, both circulations at very different pressures.

Thus the venturi effect created inside the box because of the suction of the interior air originated by the proximity of the nozzle to the internal side of the plate is compensated by the pressure of the extractor impulsion air, regulating the internal pressure of the box and preventing negative secondary effects in the impulsion of air, which must be perfectly controlled, so that the label can be guided in its way from the blowing device to the package.

This impulsion, because of the arrangement and distribution of the nozzles, as well as the diameters of the nozzles, variable according to the surface of the label to be thrown by the regulated air jets, is realized so that the label is not parallel to the plate, but curve-convex with respect to this plate, so that the central part of the label is the first to touch the package and the label sticks progressively on the surface of the package.

In order to complete this description and to facilitate the comprehension of the characteristics of the invention, there is a set of drawings attached to this document that show with an illustrative and not limitative character:

Figure 1 shows a schematic section and elevation of the blowing system, where we can see the box with an extractor and the connection of the impulsion of air to the nozzle-holder, a series of nozzles, a plate to hold the labels and the support of the box to the head of the labelling machine, that encloses this blowing system.

Figure 2 shows, in form section and elevation, the

head of the labelling machine that encloses the driving and rotating means for the label tape, and at the bottom on the left hand side, and next to the tape, the blowing system.

Figure 3 is a schematic representation of the steps to be followed by the label from the tape to the package.

We can see in these drawings that the present invention consists of a mass-labelling machine, provided with driving and uncoiling means for the label tape, that incorporated a blowing and extracting system, consisting first of an extractor (1) that generates a vacuum inside the extraction box (2), next to the label tape (3), extracting one of the labels (4), a plate (5) with a series of holes (6) that holds the label, and on the other side of these holes a series of blowing nozzles (7) arranged in a nozzle holder (11) for air jets of short duration but great intensity, fed by the delivery conduit (8) connected with a body (12) having an internal chamber (13), programmed and timed according to the labelling rate and the characteristics of the packages.

The impulsion is done so that the label (4) describes a curve-convex figure with respect to the plate (5), for an initial contact of the central part (9) with the package (10), adhering then progressively towards the periphery until it sticks completely to the package.

It is not considered necessary to make any further explanation for any expert in the matter to understand the significance and advantages of the invention.

The materials, shape, size and arrangement of the elements can be varied, provided that the essence of the invention is not altered.

The terms used in this description must be taken in a wide and not limitative sense.

Claims

1. A labelling machine for the mass labelling of packages of different shapes and sizes from a distance, the machine incorporating an extraction system comprising an extractor (1) within an extraction box (2) in which a vacuum is generated, wherein a duct (8) extends into the extraction box (2), the duct being independent of the extraction system and being connected to an impulsion air system, and wherein a body (12) is associated with the duct (8) and has an internal chamber (13), and a nozzle holder (11) is connected to the body, the nozzle holder has nozzles (7) through which air is blown to the labels, having a plate (5) which is connected to the extractor box (2), characterized in that the plate is provided with a plurality of cylindrical holes (6) through which air is sucked to hold a label on the plate, the blowing nozzles (7) having a smaller diameter than the holes (6) and the nozzles (7) being lightly introduced into the holes (6) of said plate (5), and in that the chamber (13) is frusto-con-

ical, the base of the cone facing the nozzles, and the arrangement and distribution of the nozzles, as well as the diameters of the nozzles, is so that a greater force of air is provided in the middle of the label than at the edges whereby the label is caused to be convex, so that when it contacts a package, the middle part first makes contact with the package and the remainder of the label then adheres to the package progressively towards the edges of the label until the label is completely adhered to the package.

2. A labelling machine for the mass labelling of packages of different shapes and sizes from a distance according to claim 1, **characterized** in that it is arranged to be portable.
3. A labelling machine for the mass labelling of packages of different shapes and sizes from a distance according to claim 1 and 2, **characterized** in that it is integrated into a labelling line.

Patentansprüche

1. Etikettiermaschine zum massiven Etikettieren von Behältern verschiedener Formen und Grössen aus Entfernung, wobei die Maschine ein Extraktionssystem aufweist, das eine Extraktionsvorrichtung (1) umfasst, die innerhalb eines Extraktionsgehäuses (2) angeordnet ist, in dem ein Vakuum hergestellt wird, wobei sich eine Leitung (8) ins Innere des Extraktionsgehäuses (2) erstreckt und diese Leitung unabhängig vom Extraktionssystem ist und an ein Luftbeaufschlagungssystem angeschlossen ist, und in der ein mit der Leitung (8) verbundener Körper (12) eine innere Kammer (13) aufweist, wobei ein Düsenhalter (11) mit dem Körper verbunden ist und der Düsenhalter Düsen (7) aufweist, über die Luft zu den Etiketten geblasen wird, und wobei sie ausserdem eine mit dem Extraktionsgehäuse (2) verbundene Platte (5) aufweist, dadurch gekennzeichnet, dass die Platte eine Vielzahl von zylinderförmigen Öffnungen (6) aufweist, über die Luft angesaugt wird, um ein Etikett auf der Platte zu halten, wobei die Blasdüsen (7) einen kleineren Durchmesser als die Öffnungen (6) haben und die Düsen (7) leicht in die Öffnungen (6) der genannten Platte (5) eingeschoben sind, und dass die Kammer (13) frustokonisch ist, wobei die Basis des Kegels auf der gegenüberliegenden Seite der Düsen, die Anordnung und die Verteilung der Düsen und die Durchmesser der Düsen so sind, dass die Luft mehr Kraft auf den mittleren Teil als auf die Ränder des Etiketts ausübt, weshalb das Etikett eine konvexe Form annimmt, so dass beim Anlegen des Etiketts an ein Gefäss, der mittlere Teil zuerst in Anlage an das Gefäss kommt und der Rest des Etiketts anschliessend nach und nach, in Richtung zu den Rändern des Etiketts, an dem

Gefäss haften bleibt, bis dieses vollständig am Gefäss zu haften kommt.

2. Etikettiermaschine zum massiven Etikettieren von Behältern verschiedener Formen und Grössen aus Entfernung nach Anspruch 1, dadurch gekennzeichnet, dass sie so angeordnet ist, dass sie tragbar ist. 5
3. Etikettiermaschine zum massiven Etikettieren von Behältern verschiedener Formen und Grössen aus Entfernung nach den Ansprüchen 1 und 2, dadurch gekennzeichnet, dass sie in eine Etikettierlinie integriert ist. 10

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Revendications

1. Une machine étiqueteuse pour l'étiquetage massif et à distance de récipients de différentes formes et tailles, la machine intégrant un système d'extraction qui comprend un extracteur (1) situé à l'intérieur d'un boîtier extracteur (2) où il se produit un vide, une conduite (8) s'étendant à l'intérieur du boîtier d'extraction (2), la conduite étant indépendante du système d'extraction et se trouvant raccordée à un système d'impulsion d'air, et dans laquelle un corps (12) associé à la conduite (8) a une chambre intérieure (13), un support de becs (11) étant connecté au corps et le support de becs disposant de becs (7) à travers lesquels est soufflé l'air sur les étiquettes, et étant pourvue d'une plaque (5) raccordée au boîtier extracteur (2), se caractérisant en ce que la plaque est pourvue d'une pluralité d'orifices cylindriques (6) au travers desquels l'air est aspiré pour soutenir une étiquette sur la plaque, les becs de soufflage (7) ayant un diamètre inférieur à celui des orifices (6) et les becs (7) se trouvant légèrement introduits dans les orifices (6) de cette plaque (5), et en ce que la chambre (13) est fruste-conique, la base du cône en face des becs, la disposition et la distribution des becs ainsi que les diamètres des becs étant telles qu'il est donné une plus grande force d'air sur le centre que sur les bords de l'étiquette, selon quoi l'étiquette se fait convexe, de sorte que, au contact avec le récipient, la partie centrale contacte en premier avec le récipient puis le reste de l'étiquette adhère au récipient progressivement vers les bords de l'étiquette jusqu'à ce qu'elle soit complètement adhérente au récipient. 20 25 30 35 40 45 50
2. Une machine étiqueteuse pour l'étiquetage massif et à distance de récipients de différentes formes et tailles, selon la revendication 1, se caractérisant en ce qu'elle est disposée de manière à être portable. 55
3. Une machine étiqueteuse pour l'étiquetage massif et à distance de récipients de différentes formes et tailles, selon les revendications 1 et 2, se caractérisant en qu'elle intègre une ligne d'étiquetage.

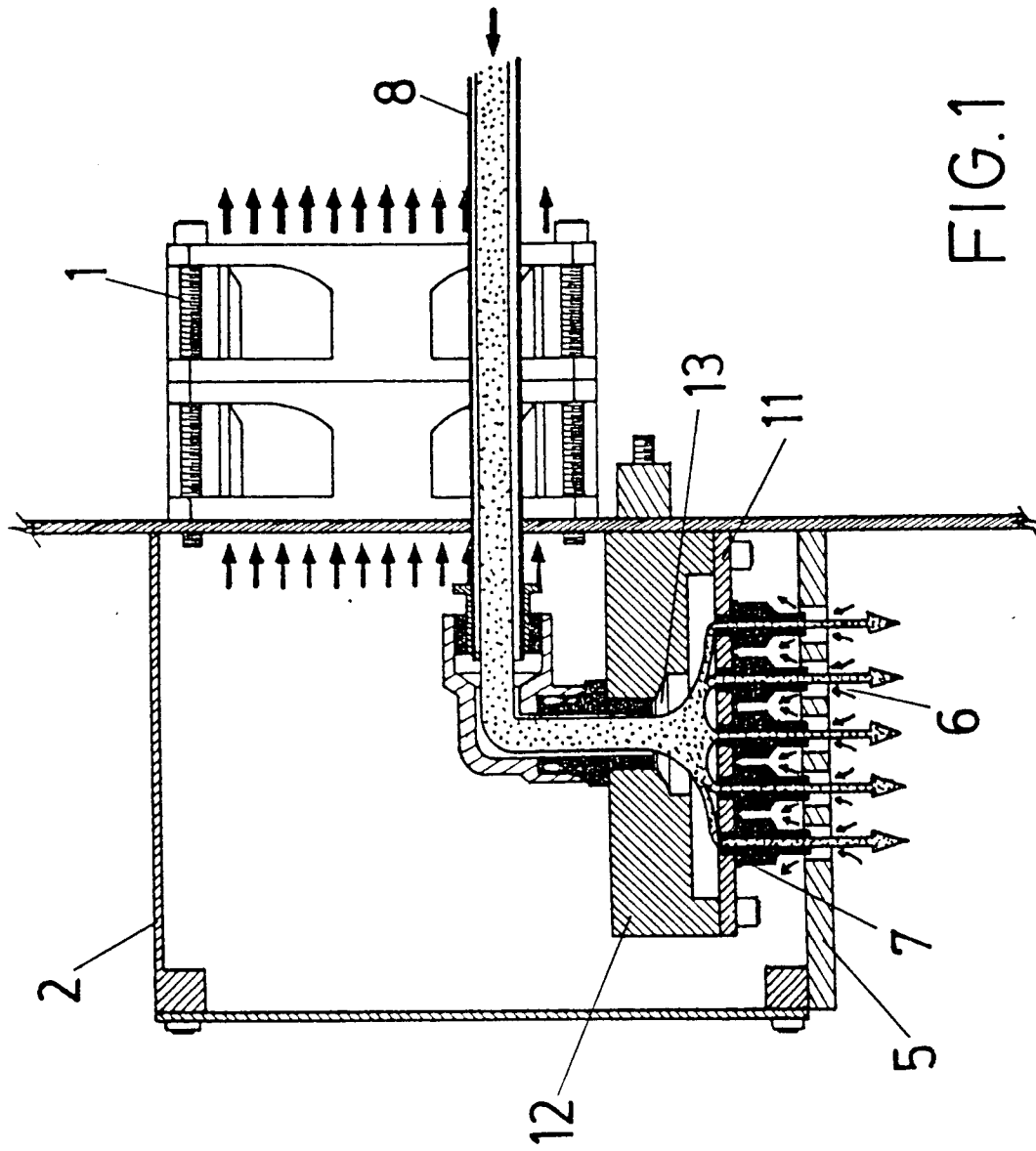
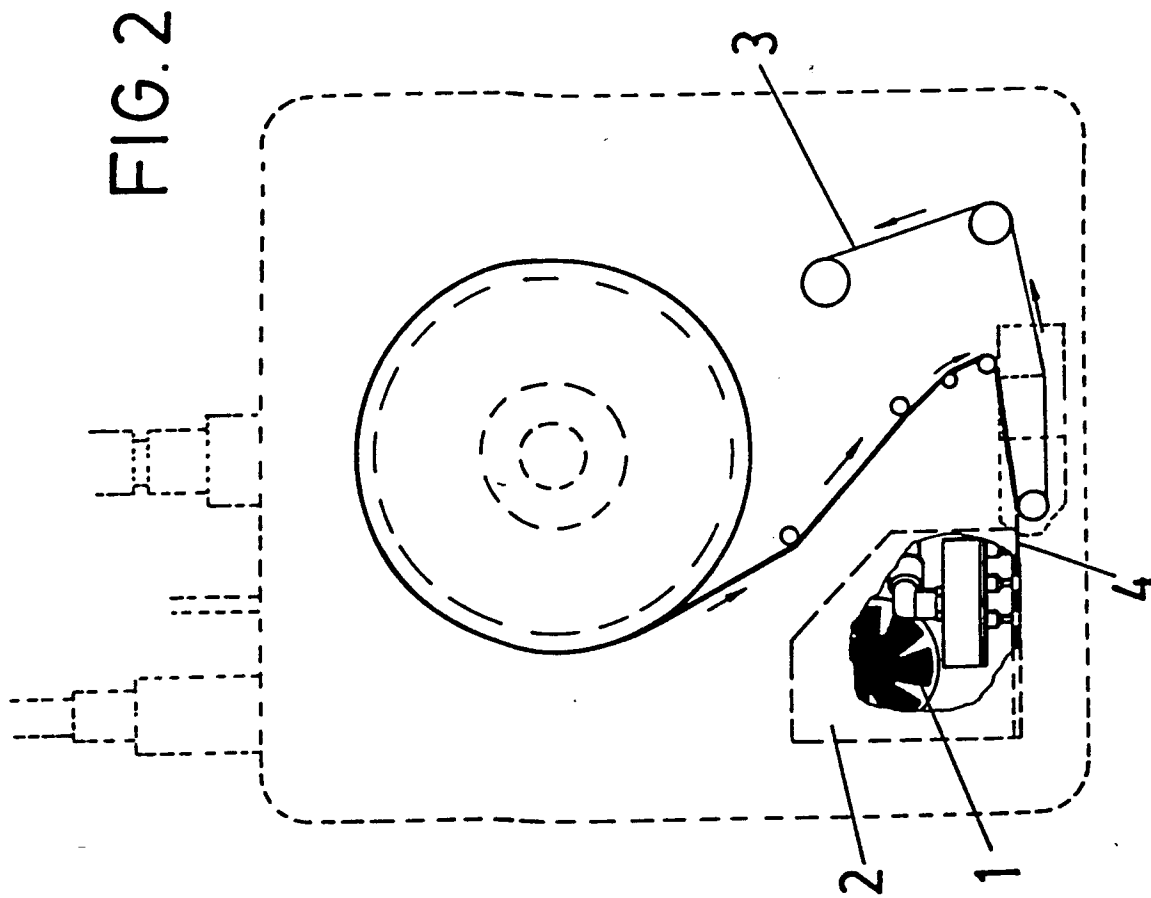


FIG. 1



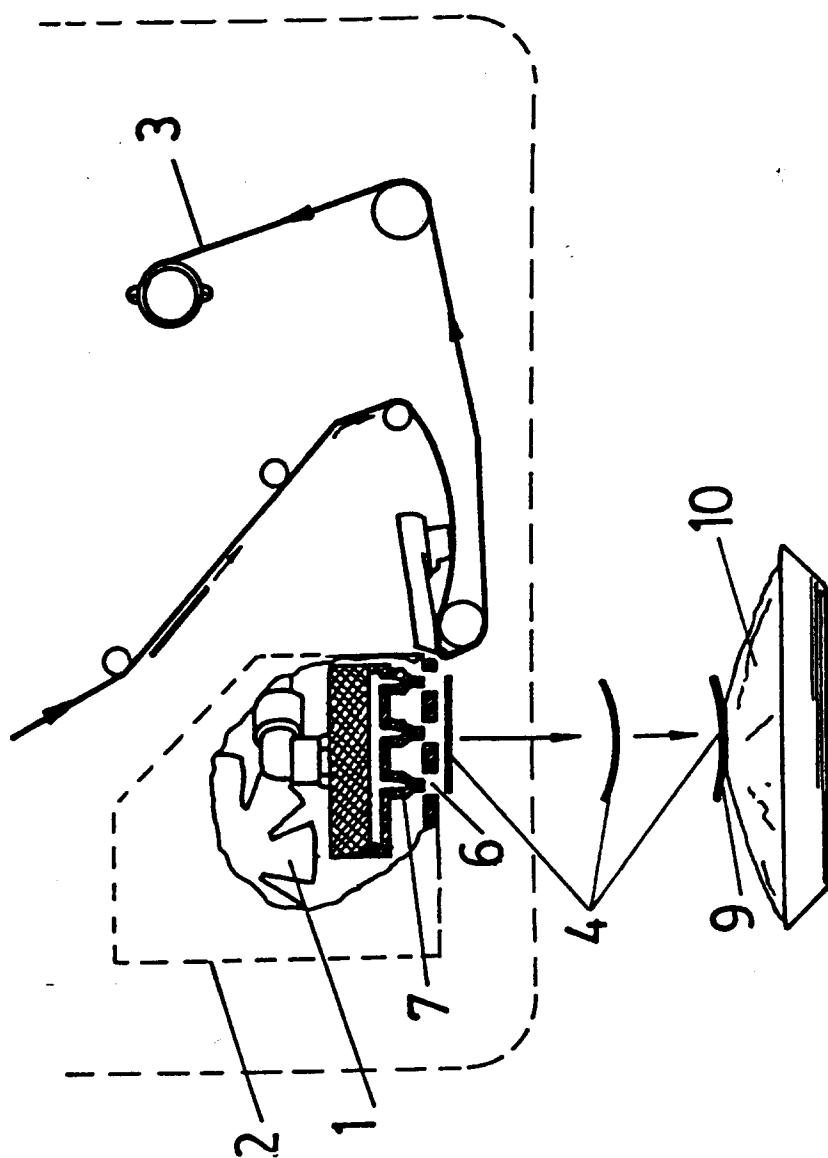


FIG. 3