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Device for taping containers with stripes of adhesive tape.

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Description

The present invention relates to the technical field of the machines for packaging products into box-type containers. Said machines provide for forming the box-type container, e.g. starting from a suitable cardboard blank, and for filling it with a plurality of packaged products. Subsequently, the walls of the container are locked by means of stripes of adhesive tape in a taping device according to the preamble of claim 1.

Therefore, the need arises to apply the adhesive tape to the containers automatically, in a fast and efficient way, so to avoid slowing down the production line.

At present in said machines the container to be sealed is made to pass by a taping device which provides for applying a stripe of adhesive tape on the heads of the container. The ends of said stripe of adhesive tape are opportunistically applied on the longitudinal walls of the container, wrapping the edges formed by said walls and the heads.

In fact it is well-known that the tear resistance of the taping is dependent on the portion of tape which is able to operate under traction. In particular, the strength of the taped bottom of the container depends on the portion of tape applied on the side walls of the container, i.e. in a direction parallel to the stress exerted by the products on the bottom itself.

However, the taping devices presently known are not suited to ensure the application of a side portion of tape sufficiently long; or they leave flaps of tape not adherent to the container and therefore useless for the desired purpose.

Other known devices require a subsequent finishing on special pressing rollers, with an obvious waste of time, increase in production costs and further complexity of the gears designed for this purpose.


The apparatus is also equipped with means for keeping the cartons in uniformly spaced relation, and with means for adhesively applying a closing tape extending from carton to carton.

The apparatus includes also a movable cutting head equipped with a severing and tensioning knife and operated by operative means which causes the cutting head to move toward the tape so as to engage, tension and finally cut the same.

The head is then successively made to enter the space between the two cartons located under the movable head so that a pair of inwardly swingable pressure rollers mounted on the head, come into contact with the tape pressing it against the end of the cartons.

The swinging rollers are constantly kept outwardly by springs and swing inwardly when the rollers strike the counterfacing side walls of the two cartons.

Because of this construction, the positioning of the space between two subsequent cartons must be very precise, because the swinging rollers will not swing inwardly if the space is too small or too big.

Also the positioning of the space in respect of the side taping device must be very precise, because only one roller will swing inwardly if the gap is not correctly positioned in respect of the taping device, while the other roller will push over the top of the underlying carton.

The knife is made stationary with respect to the support plates of the head and therefore cannot be actuated at a proper time. The knife is moved downwards along with the head and therefore it works at a fixed time, necessarily before the rollers start to operate.

One of the objects of this invention is the provision of a device able to carry out, in a fast and efficient way, the taping of containers with stripes of adhesive tape, thus ensuring the strength of the same taping.

Another object of the present invention is the provision of a device for taping containers with stripes of adhesive tape, which turns out to be of simple construction, not very cumbersome, functional and reliable, as well as of versatile use.

The above-mentioned objects are accomplished by means of a device for taping containers with stripes of adhesive tape as described in the claims.

The device provided by the present invention is of very simple construction, and is able to ensure an optimal application of the adhesive tape on the container heads, with extremely reduced overall dimensions.

Furthermore, the device operates directly on the conveying line and in phase with it, thus no means are required for supplying the taping station with containers.

This means a more simplified construction, while the insertion of the device along the line does not involve a slowing down of the conveying line and thus of the production speed.

A further advantage of the device provided by the invention is its automatic adjustment to uneven spacing intervals among the containers, without prejudice of the quality of taping.

The device provided by the invention allows the use of any kind of tape, e.g. adhesive paper to be moistened, which is cheaper than the self-adhesive tape, but not applicable in the case that the device operates with the containers in motion, owing to the insufficient initial adhesion of the glueing.

The invention will be described further, by way of example, with reference to the accompanying drawings, wherein:
- Fig.1 is a plan view of a tapping unit of the device provided by the present invention;
- Fig.2 is a side view of said tapping unit;
- Figs.3a, 3b, 3c and 3d show, in a plan view, subsequent operating phases of the tapping unit;
- Fig.4 is a side view, partially sectional, of the tapping unit in the phase of cutting said adhesive tape.

Referring to the above-mentioned figures, the tapping device comprises a pair of tapping units, generally designated by the numeral 1, which are disposed symmetrical to the sides of a line L for conveying the containers 2. The containers advance in step along said line, spaced out from one another by an interval S, of adjustable width, suited to allow the insertion of the tapping units 1 correspondingly with a tapping station N.

The tapping units 1, of which only one is illustrated in the drawings, respectively provide an operating head which is movable alternatively in a direction transversal to the conveying line L, between a position external to the same line and a position of maximum insertion inside the spacing interval S.

The operating head 3 is fastened to an end of a pair of rods 4 which are slidably guided through a support body 5 stably integral with the frame 6 of the machine. The support body 5 bears, fastened to its top, a wedge 7 having its point turned towards the operating head 3.

At the opposite end the rods 4 are connected by a rear head 8. To the rear head 8 is fastened, longitudinally to the rods 4, a bracket 9 with which is articulated, on a transverse pin 10, a driving arm 11. The arm is set in reciprocating motion by suitable motive means, as indicated by arrow A in fig.1.

The rods 4 have a tubular shape and bear, sliding inside themselves, respective stems 12 protruding, at the opposite ends, from the rods themselves.

At one end the stems 12 bear a cutting means 13 provided with a toothed blade 13a. The cutting means 13 is disposed in a vertically middle position corresponding with the operating head 3.

At the other end the stems 12 are connected by a bar 14. On the portion of the stems 12 protruding at the rear from the rods 4 is mounted a pair of helical springs 15, acting by compression between the rear head 8 and the bar 14. The springs 15 are aimed at keeping the cutting means 13 elastically striking against the operating head 3, in rest position.

With the operating head 3 is articulated a pair of rocker means 16, independent of each other, revolving on a relative central pivot 17 with vertical axis. The rocker means 16 are respectively made up of a pair of rockers 16a, 16b mounted parallel on the upper face and on the lower face of the operating head 3 and connected at one of their ends by a roller 18; the roller 18 has a vertical axis and thus results to be parallel to the surface of the heads 2a and of the side walls 2b of the containers conveyed on the line L.

At the opposite end, the upper rockers 16a bear respective rollers 19, rotating and having vertical axes. The upper rockers 16a are practically disposed on the same horizontal plane as the wedge 7.

The rocker means 16 are impelled by relative spring means 20, fastened to the pivots 17 and suited to keep the same means 16 elastically diverging at their front end, i.e. correspondingly with the rollers 18. The closing of the rocker means 16 is designed to be actuated by the insertion of the wedge 7, as will be hereinafter pointed out.

On the pin 10 of articulation of the arm 11 is also mounted a rocking lever 21 driving the cutting means 13. The lever 21 bears at its lower end a roller 22 which is suited to engage with a longitudinal cam 23 fixed on the frame 6 of the machine; whereas at its upper end it features a tooth 21a which is suited to engage with a roller 24 supported cantilevering, with horizontal axis, by the bar 14.

The rocker means 16 are suited to intercept, through the rollers 18, a stripe of adhesive tape 25 to be applied on the cardboard containers 2. In particular, the rocker means intercept the portion of adhesive tape 25 which extends between conventional tape-feeding means, not illustrated in the drawing, and the longitudinal wall 2b of the container 2 located downstream of the tapping station N.

The containers 2 advance in step along the conveying line L, stopping when the spacing interval S is in correspondence with the tapping station N. In that very instant the operating head 3 is in a position external to the spacing interval S, as may be seen in fig.3a.

In such a position, the operating head 3 is close to the support body 5 and consequently the wedge 7 results to be inserted between the rocker means 16, so that these latter turn out to be basically parallel to each other.

With the stopping of the conveying line L, the operating head 3 is actuated to move inwards into the spacing interval S, through the sliding of the outer rods 4 on the support body 5. Said move causes the opening of the rocker means 16 in the diverging position, as it may be seen in fig.3b.

As a matter of fact the means 16 separate from the wedge 7, fixed to the body 5, and are impelled to open by the respective springs 20.

Through the rollers 18, the rocker means stretch the adhesive tape 25 and act by pressure on the rear and front heads 2a of the containers 2 located respectively upstream and downstream of the tapping station N, so bringing about the adhesion of the tape itself to said heads.

Going on with the sliding of the operating head 3, the roller 22 of the lever 21, set in motion by the same head 3, hits the fixed cam 23. This causes the angular
rotation of the lever 21 which is forced to act, through the roller 24, on the bar 14 integral with the stems 12. Thus the stems 12 slide inside the rods 4, in contrast with the springs 15, causing the advance, or release, of the cutting means 13 with respect to the operating head 3, as illustrated in fig. 4.

Thus the adhesive tape 25 is cut by the blade 13a of the cutting means 13 in two portions 25a, as it is visible in fig. 3c. The cutting features are determined by the dimensions and by the position of the cam 23, which is conveniently adjustable according to the requirements of use.

Then the operating head 3 continues its travel, so to allow the rollers 18 to cause the complete adhesion of the portions 25a of the tape to the heads 2a of the containers 2, as it is visible in fig. 3d. Once this phase has been completed, the operating head 3 carries out the return travel. The rocker means 16, held in diverging position by the springs 20, press elastically with the rollers 18 against the heads 2a, to complete the application of the portions 25a of the adhesive tape 25.

At the end of the return travel, the rocker means 16 engage again with the wedge 7, through the rollers 19, going back to the closing position. Thus it is possible to control the advance of the containers 2 along the conveying line L. During said advance, the adhesive tape 25 is applied on the longitudinal wall 2b of the container which previously occupied the position upstream of the taping station N.

Claims

1. Device for taping containers with stripes of adhesive tape, these containers (2) being made to advance in step and spaced out from one another by an interval (S) along a conveying line (L), said device including a pair of taping units (1) disposed symmetrical to the sides of said conveying line (L) at a taping station (N), each of which comprises: at least one operating head (3) movable alternatively in a direction transversal to said conveying line (L) between an outer position and an inner position with respect to said spacing interval (S) so as to insert thereinto; a pair of rocker means (16) articulated with said operating head (3) which are suited to intercept a stripe of adhesive tape (25) and to act by pressure on the front and rear heads (2a) of the containers (2) disposed respectively downstream and upstream of said taping station (N); spring means (20) fastened to respective pivots (17) and acting on said rocker means (16) so as to keep them elastically diverging at the front end; a cutting means (13) suited to cut said stripe of adhesive tape (25) held by said rocker means (16); said device being characterized in that said rocker means (16) are adapted to intercept said adhesive tape while said rocker means (16) are kept in a closed position and while said adhesive tape extends between a longitudinal wall (2b) of the container (2) placed downstream of said taping station (N) and a tape feeding means, said rocker means (16) are caused to open to diverge elastically in the phase of insertion into said spacing interval (S), and in that means (21) are provided for advancing, said cutting means (13) in phased relationship with the insertion of said operating head (3) into said spacing interval (S).

2. Device according to Claim 1, characterized in that said operating head (3) is fastened to an end of a pair of rods (4) which are slideably guided through a support body (5) stably integral with the frame (6) of the machine and which are connected, at their opposite end, by a rear head (8) bearing articulated an arm (11) driving the same operating head, set in reciprocating motion by suitable motive means.

3. Device according to Claim 1, characterized in that it comprises a wedge (7), fastened to a support body (5), having its point turned towards said operating head (3), and which is suited to engage between said rocker means (16), correspondingly with said outer position of the operating head (3), so to actuate the closing of the rocker means (16) themselves in contrast with the spring means (20).

4. Device according to Claims 1 and 2, characterized in that said rods (4) have a tubular shape and bear, sliding inside themselves, respective stems (12) which protrude, at opposite ends, from the rods themselves and bear at one of said ends said cutting means (13), and which are suited to be engaged at the opposite end with said means (21) for driving the cutting means (13).

5. Device according to Claims 1 and 4, characterized in that on the portion of said stems (12) protruding from the rear end from said rods (4) is mounted a pair of helical springs (15), acting by compression between the rear head (8) and a bar (14) connecting the end of the same stems (12), with said springs (15) being suited to keep said cutting means (13) elastically striking against said operating head (3), in rest position.

6. Device according to Claims 1 and 3, characterized in that said rocker means (16) are respectively made up of an upper rocker (16a) and a lower rocker (16b) mounted parallel to each other on said operating head (3) and connected with the
front end by a roller (18), the upper rockers (16a) being disposed on the same horizontal plane as said wedge (7) and bearing revolving, at the rear end, respective rollers (19) with vertical axis, through which they are designed for holding the wedge (7) itself in the closing phase.

7. Device according to Claims 1 and 2, characterized in that said means (21) for driving said cutting means (13) are provided with a lever mounted swinging on said rear head (8), said lever (21) being suited to engage at one end, through a roller (22), with a longitudinal cam (23) fixed on the frame (6) of the machine, and also to act at the opposite end on respective stems (12) integral with said cutting means (13).

 Patentansprüche

1. Vorrichtung zum Aufbringen von Klebebandstreifen auf Behälter. Die Behälter (2) werden schrittweise über eine Förderlinie (L) zugeführt und stehen jeweils in einem Abstand (S) voneinander entfernt. Die Vorrichtung umfaßt ein Paar Klebe- gruppen (1), die symmetrisch seitlich an der genannten Förderlinie (L) in einer Klebestation (N) angeordnet sind. Jede Klebegruppe (1) besteht jeweils aus:

Mindestens einem, quer zur Förderlinie (L) beweglichen Arbeitskopf (3), der wechselweise eine im Verhältnis zum genannten Abstand (S) äußere Stellung oder eine innere Stellung einnehmen und somit in diesen Abstand (6) einrücken kann; einem Paar Schwingvorrichtungen (16), die beweglich mit den Arbeitsköpfen (3) verbunden sind und dazu dienen, einen Klebebandstreifen (25) mitzunehmen und gegen die Vorder- bzw. Rückseite (2a) der Behälter (2) zu drücken, die sich vor bzw. nach der genannten Klebestation (N) befinden;

einer Feder (20), die an entsprechenden Zapfen (17) befestigt ist und auf die genannten Schwingvorrichtungen (16) wirkt, so daß diese am vorderen Ende federnd auseinander gehalten werden; einer Schneidevorrichtung (13) die dazu dient, den von der Schwingvorrichtung (16) gehaltenen Klebebandstreifen (25) abzuschneiden.

Die genannte Vorrichtung ist dadurch gekennzeichnet, daß die Schwingvorrichtung (16) dafür vorgesehen ist, den genannten Klebebandstreifen mitzunehmen, während die Schwingvorrichtung (16) geschlossen ist und das Klebeband zwischen einer Längswand (2b) des vor der Klebestation (N) stehenden Behälters (2) und einem Klebebandspender gespannt ist. Die genannte Schwingvorrichtung (16) wird bei der Einführung in den Abstand (S) geöffnet, so daß sie vorne fe-

dernd auseinanderklappt. Die Vorrichtung ist außerdem dadurch gekennzeichnet, daß eine Vorrichtung (21) vorgesehen ist, die zur Vorwärtsbewegung der Schneidevorrichtung (13) in gleicher Phase mit der Einführung des Arbeitskopfes (3) in den Abstand (S) dient.


3. Vorrichtung gemäß Anspruch 1, dadurch gekennzeichnet, daß sie mit einem Keil (7) versehen ist, der an einer Halterung (5) befestigt ist und dessen Spitze in Richtung Arbeitskopf (3) zeigt. Der Keil (7) greift zwischen die Schwingvorrichtungen (16) ein, wenn sich der Arbeitskopf (3) in der genannten äußeren Stellung befindet, und bewirkt so das Schließen der Schwingvorrichtungen (16), denen die Feder (20) entgegenwirkt.


5. Vorrichtung gemäß Ansprüchen 1 und 4, dadurch gekennzeichnet, daß an den am hinteren Ende der Stangen (4) herausragenden Abschnitt der Stäbe (12) ein Paar Schraubenfedern (15) montiert ist, deren Wirkung auf der Kompression zwischen dem hinteren Kopfstück (8) und einem Riegel (14), der die Enden der beiden Stäbe (12) miteinander verbindet, beruht. Die Federn (15) bewirken, daß die genannte Schneidevorrichtung (13) in Ruheposition elastisch gegen den Arbeitskopf (3) stößt.

6. Vorrichtung gemäß Ansprüchen 1 und 3, dadurch gekennzeichnet, daß die genannten Schwingvorrichtungen (16) jeweils aus einem oberen Schwinger (16a) und einem unteren Schwinger (16b) bestehen, die parallel zueinander auf dem
les dispositifs (21) font avancer ladite lame (13) en synchronisation avec l'introduction de ladite tête opérationnelle (3) dans ledit espace (5).

2. Dispositif selon revendication 1 caractérisé en ce que ladite tête opérationnelle (3) est fixée à une extrémité de deux barres (4) qui coulissent dans un support (5) faisant partie intégrante du bâti (6) de la machine et qui portent, à l'autre extrémité, une tête arrière (7) sur laquelle s'articule un bras (11) qui pilote ladite tête opérationnelle, selon un mouvement de va-et-vient transmis par un système approprié.

3. Dispositif selon revendication 1 caractérisé en ce qu'il comprend une cale (7), fixée à un support (5), avec la pointe orientée vers ladite tête opérationnelle (3) et qui s'engage entre lesdits bras oscillants (16) lorsque la tête opérationnelle (3) se trouve en position externe de façon à permettre la fermeture desdits bras oscillants (16) en contraste avec l'action des ressorts (20).

4. Dispositif selon revendications 1 et 2 caractérisé en ce que les barres (4) sont tubulaires avec, à l'intérieur, des tiges (12) coulissantes qui dépassent aux deux extrémités, portent ladite lame (13) à une extrémité et s'engagent, à l'autre extrémité, dans lesdits dispositifs (21) de façon à transmettre le mouvement à la lame (13).

5. Dispositif selon revendications 1 et 4 caractérisé en ce que, sur la portion desdites tiges (12) dépassant à l'arrière desdites barres (4), sont montés deux ressorts hélicoïdaux (15) qui exercent une pression contre la tête arrière (7) et une barre (14) reliant l'extrémité desdites tiges (12), avec les ressorts (15) maintenant la lame (13) contre ladite tête opérationnelle (3), en position de repos.

6. Dispositif selon revendications 1 et 3 caractérisé en ce que lesdits bras oscillants (16), respectivement supérieur (16a) et inférieur (16b), sont parallèles et montés sur ladite tête opérationnelle (3) alors qu'ils sont reliés à l'extrémité avant par un galet (18), avec le bras supérieur (16a) se trouvant sur le même plan horizontal que ladite cale (7) en supportant, à l'arrière, les galets respectifs (19) à axe vertical de façon à supporter ladite cale (7) en phase de fermeture.

7. Dispositif selon revendications 1 et 2 caractérisé en ce que lesdits dispositifs (21) de transmission des mouvements à ladite lame (13) sont munis d'un levier (21) s'engageant à une extrémité, par l'intermédiaire d'un galet (22), dans une came longitudinale (23) fixée sur le bâti (6) de la machi-
ne et agissant, à l'autre extrémité, sur les tiges correspondantes (12) faisant partie intégrante de ladite lamé (13).