DEVICE FOR FEEDING BROCHURES

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6 Claims

ABSTRACT OF THE DISCLOSURE

A device for feeding and adding brochures or the like to uniformly spaced and continuously moving articles, comprising a brochure supplier which delivers brochures one at a time to a rotary table having radially directed tongs thereon which transfer the brochures received from the brochure supplier to a brochure conveyor moving alongside an article conveyor. The brochure conveyor is provided with clamping pockets which transfer the brochures to pockets of the article conveyor.

The invention relates to a device for feeding and adding descriptive literature, such as brochures, directions for use, and the like, to a stream of uniformly spaced identical articles continuously advanced by a filling goods conveyor of a packaging machine, for example an endless conveyor chain provided with filling goods pockets. The device further includes a brochure supplier for advancing the folded brochures and transferring them to receptacles associated with the filling goods pockets of the conveyor and at least one guide bar for directing the free ends of the brochures into the desired position.

It is known to package tubes, bottles and the like together with advertising literature or directions for use in folding boxes by means of packaging machines. The articles to be packaged are continuously equidistantly conveyed by means of a conveyor which, as a rule, is a conveyor chain provided with pockets for receiving the filling goods, and are fed to a folding box filling and closing station where they are pushed by slide plates into the folding boxes arranged in parallel relationship.

Difficulties, however, arise in the feeding and adding of enclosures to the individual articles on the conveyor. In a known device a brochure supplier conveys brochures taken from a stack and subsequently folded by folding means to the conveyor chain laden with filling goods and inserts these brochures with one end into receiving pockets provided on the conveyor chain and associated with the filling goods pockets. The brochures are then taken along by the conveyor whereby the sections protruding from the receiving pockets are placed by guide bars in a position in front of the discharge opening of the filling goods pockets so that the brochures at the folding box filling station lie between the articles to be packaged and the open front ends of the folding boxes and on inserting the articles into the folding boxes are taken along by the articles.

While machines equipped with the just described brochure supplier work reliably at relatively low operating speeds provided the brochures paper is heavy, they are not suitable for high speed operation and thin paper enclosures because then the enclosures to be inserted with one end into a receiving pocket of the conveyor tend to crumple and either are not at all insertable into the receiving pocket or at least are not properly placed with respect to the filling goods articles.

The objection of the invention is therefore the improvement of devices for conveying and feeding brochures and the like to filling good articles to be packaged in folding boxes.

Proceeding from a machine of the aforesaid type, the solution of the problem according to the invention consists in that the receptacles for the brochures are arranged on a continuous endless brochure conveying device extending adjacent and along the filling goods conveyor and are constructed in the form of clamping pockets controlled by cams. The brochure conveying device comprises most efficiently an endless chain guided over two chain wheels. These wheels may be in axial alignment with the drive roller and the deflecting roller and may be adjusted to different angular positions with respect to these rollers; otherwise, they may be arranged on the same shaft and secured thereon against rotation.

A modification of the invention provides for an oscillatable brochure transfer device arranged between the discharge end of the brochure supplier and a point of transfer to the clamping pockets of the brochure conveyor. This brochure transfer device consists of at least one pair of tongs executing a preferably circular orbit and having one leg acted upon by a spring force in the direction of its closing position so that by means of a stationary cam disc it is directed against the action of the closing spring into the opening position such that the tongs in its open position at the discharge end of the brochure supplier seize a protruding section of the brochure, then closes and in its closed position arrives at the transfer point to the brochure conveying device where it opens up again.

The movable leg of the tongs may be mounted on a rotary table and may be pivotable perpendicular to the table plane. It may further be equipped with a lever provided with a roller which is constructed as a cam disc follower and which during rotation of the rotary table moves frictionally along the circumference of the stationary cam disc, thus controlling the tong leg in accordance with the contours of the cam disc.

According to another feature of the invention the rotary table may be rigidly connected to a cam disc having a control cam thereon which is associated with the tongs of the transfer device and in cooperation with a protruding lever arm of the clamping pockets of the brochure conveyor. The clamping pockets are opened by this control cam in the region of the transfer station, but on further rotation of the table are released so that a brochure advanced by the transfer device to the transfer point may enter into a clamping pocket with its front end and may be held by it. In order for the cam disc rigidly connected with the rotary table to execute its control function, the table and with it the cam disc rotate at such a speed that the circumferential velocity is somewhat higher than the linear velocity of the brochure conveyor synchronously moved with the filling goods conveyor.

The device in accordance with the invention may further be provided with a cam disc secured to the cam disc rigidly connected with the rotary table and controlled by a cam disc follower by means of another stationary cam disc in a manner such that the follower slides behind the cam disc followed by means of another stationary cam disc in a manner such that the follower slides behind the brochure seized by the tongs of the transfer device at the discharge end of the brochure supplier and conveyed to the transfer station in the region of a clamping pocket of the brochure conveying device and supports that end of the brochure not held by the tongs. As soon as the brochure has been transferred by the transfer device to the clamping pocket of the brochure conveyor, the follower is pivotally withdrawn.

The invention will be described in further detail with reference to an exemplary embodiment illustrated in the accompanying drawings, in which:

FIG. 1 is a side view of the device according to the invention;
FIG. 2 is a top view of this device; FIG. 3 is a partial top view of the device, and FIG. 4 is a side view similar to FIG. 1. The device for feeding and depositing brochures or similar enclosure's or a stream of identically uniformly spaced articles continuously advanced by a filling goods conveyor consists primarily of a brochure transfer device 1 associated with a brochure supplier 2 and a brochure conveyor 3 which continuously moves together with a conveying goods conveyor 4 carrying the articles to which the brochures or the like are to be added.

The brochure transfer station is in the form of a rotary table 5 and is rotatably mounted on the machine frame by means of a vertical shaft 6. Disposed on the rotary table 5 are four tongs 7 which are pivotable between an opening and a closing position and are equidistantly arranged from the center of the rotary table 5 and at uniform angular distances from each other. Below the rotary table 5 are arranged in axial spaced relationship from each other two stationary cam discs 8 and 9 through which extends the vertical shaft 6 of the rotary table 5. A cam disc 11 is rigidly connected to the rotary table 5 by means of vertical connecting elements 10.

Each tong 7 has a tong arm with the legs 12, 13 mounted on a horizontal pivot pin 14 and is pivotable in a plane perpendicular to the rotary table 5. The leg 12 of the tongs extends from the pivot pin 14 outwardly onto the top of the rotary table 5 and carries at its outermost end a plate 15 with a surface which is parallel to the table plane. The leg 13 of the two-armed lever of the tongs 7 extends from the pivot pin 14 substantially vertically downward and at its outermost end carries a roller 16 forming a cam disc follower and cooperating with the stationary cam disc 8. The two-armed tong portion is engaged by a not illustrated spring which exerts a force acting in the direction closing the tongs. Thereby the roller 16 is held to the lower end of the tong leg 13 is kept in operative engagement with the cam disc 8.

The cam disc 8 comprises substantially the two circular segments 17 and 18 (FIG. 3) and the transitions between these two segments. The radius of the circular segment 17 is larger than that of the segment 18 and is of such a size that the roller 16 of each tong 7 which during the rotation of the rotary table 5 moves along the periphery of the cam disc is urged outwardly in the region of the cam segment 18 by an amount which corresponds to the width of the tongs 7 whereby the tong arm is pivoted about the pivot pin 14 into the opening position. If the roller 16 is in the region of the cam segment 17, the tongs 7 are kept in their closed position by the action of a not illustrated closing spring, i.e. the surface of the plate 15 on the leg 12 is parallel with the rotary table plane and engages the upper face of the rotary table. The transitions between the two cam segments 17 and 18 are so arranged that each tong assumes its closed position when it is in the region of the discharge ends of the brochure supplier and opens again at the transfer station to the filling goods conveyor.

Arranged in advance of the brochure transfer device 1 is the brochure supplier 2. The brochure supplier 2 consists of two endless conveyor band pairs 20, 21 and 22, 23 which are spaced from each other and terminate tangentially at the rotary table 5 of the transfer device 1, leaving, however, a gap between the rotary table 5 and the lower band pair 22, 23.

The discharge ends 24 of the conveyor belts of the brochure supplier are so guided by deflecting rollers 25, 26 that the two strands 27, 28 of the two conveyor belts of a pair of conveyer convey and engage one another so as to advance the brochures 29 to the rotary table 5 and into the grasp of the tongs 7 disposed on the rotary table 5. The brochures 29 are folded and delivered to the brochure supplier by means which do not form part of the present invention.

The filling goods conveyor 4 is vertically arranged to the brochure supplier 2 and likewise is disposed parallel with a tangent to the rotary table 5. This conveyor 4 comprises substantially two parallel conveyor chains 30, 31 having horizontal bars 32, 33 attached thereto. The conveying belt formed by the chains 30, 31 and the bars 32, 33 are guided by vertical guide bars 34, 35, 36. Attached to the bars 32, 33 are angular members 37, 38 in such a manner that they are alternately attached to the bars of the chains 30 and 31 of the filling goods conveyor 4. The chains 30, 31 are endless and are guided by not illustrated sprocket wheels. For the purpose of adjusting the size of the filling goods pockets the sprocket wheels are adjustable to one another within a certain angular range and operate at the same speed.

The brochure conveyor 3 is arranged at the side of the filling goods conveyor 4 which faces the rotary table 5. The brochure conveyor 3 consists of a conveyor chain 40 moving in unison with the conveyor 4 and having attached thereto clamping pockets 41. The clamping pockets 41 are formed by a leg 42 rigidly connected to the transport chain 40 and by a leg 43 by means of a pivot pin 43 is disposed in a plane parallel with the plane of the rotary table 5. A closing force is imparted to the lever 44 by a not illustrated spring. The leg 42 of the clamping pocket 41 extends approximately parallel to the direction of movement of the transport chain 40. The pivotally mounted two-armed lever 44 has an arm 45 extending from its pivot pin 43 toward the leg 42 and a leg 46 extending from the pivot pin 43 into the opposite direction. The leg 46 is offset with respect to the arm 45 and projects from the conveyor chain 40 toward the transfer device 2.

The brochure conveying device formed by the transport chain 40 and the clamping pocket 41 is arranged at the same elevation as the cam disc 11 rigidly connected with the rotary table 5. The cam disc 11 is provided with the same number of cams 48 as the rotary table 5 has tongs 7. The tong legs 46 of the clamping pockets 41 of the brochure conveyor 3 project into the range of rotation of the cams 48. The arrangement of the cams 48 is such that they are able to cooperate with the protruding legs 46 of the clamping pockets when the latter are at the transfer station and a pair of tongs 7 of the transfer device holding a brochure arrive at the transfer station. After the brochure is seized by the clamping pockets, the cams 48 disengage the legs 46 and the clamping pockets close by the action of a spring force on the lever 44.

On the cam disc 11 and below the tongs 7 disposed on the rotary table 5 are arranged by means of pivot pins the follower levers 50 which are pivotable in a plane parallel to the rotary table plane. Rigidly connected with each follower lever 50 is a second lever 51 carrying at its end a roller 52 acting as a cam follower. In the same plane as the roller 52 is disposed between the stationary cam disc 8 and the cam disc 11 rigidly connected to the rotary table 5 a stationary cam disc 9 which is provided with a cam 53. The roller 52 of the follower lever 50 is in contact with the cam disc 9 in that it is kept in operative engagement with the peripheral edge of the cam disc 9 by means of a spring 54. The cam 53 is so arranged that the follower lever 50 slides behind the protruding end of the brochure in order to support it, but releases it at the transfer station by pivotal withdrawal to a retracted position.

During operation of the device the folded brochure 29 are successively and equidistantly fed by not disclosed means to the receiving end of the supplier and are conveyed to the discharge end of the brochure supplier. One end of the brochures extends into the tangential range of the rotary table 5 and is seized by the tongs 7. At this moment the roller 16 controlling the respective tong 7 arrives at the transition between the cam segment 18 and the cam segment 17 of the cam disc 8 and the tongs close. The portion of the brochure not seized by the tongs 7 is
now moved during the further rotation of the continuously rotary table 5 below the guide bar 55 which slants downwardly and extends close to the transfer station and the brochure is gradually bent downward by this guide bar 55. In order to avoid deformation of the brochures which have only a small natural rigidity, with each tongs 7 is associated the lever 50 which by means of the cam disc followers 52 is pivoted from out of a retracted position against the action of a spring 54 and supports the brochures from the rear. When the tongs holding a brochure arrive in the proximity of the transfer station at the brochure conveyor, the cams 48 of the cam disc 11 are caused to cooperate with the protruding legs 46 of the clamping pockets 41 of the brochure conveyor so as to open the same so that the portion of the brochure that is bent downward may be inserted into the clamping pocket. Subsequently, the cams 48 release the legs 46 of the clamping pockets 41 and the rollers 16 controlling the tongs 7 pass into the transition region between the cam segments 17 and 18 of the cam disc 8 so that the tongs 7 are caused to release the brochure which then is taken over by the clamping pocket of the brochure conveyor 3.

What I claim is:

1. A device for feeding and adding brochures and the like to uniformly spaced articles arranged on and continuously advanced by an article conveyor, comprising an endless conveyor chain including means forming articles receiving pockets, said conveyor delivering said articles to a packaging machine, the device including a brochures supplier for advancing said brochures and delivering them with one of their ends to receivers associated with said article pockets of said conveyor, at least one guide bar for directing the other ends of said brochures into the desired position, an endless brochures conveyor (3) disposed transversely of said brochures supplied between the latter and said endless article conveyor, said brochures conveyor being provided with said brochures receivers and extending alongside and parallel to said article conveyor (4), means moving said brochures conveyor continuously with said article conveyor, said brochures receivers being constructed in the form of clamping pockets, and means controlling the opening and closing of said clamping pockets.

2. A device according to claim 1, including a brochure transfer device, means for oscillating said brochure transfer device between the discharge end (24) of said brochures supplier and a brochure transfer station where the brochures are inserted into the clamping pockets of said brochure conveyor.

3. A device according to claim 2, in which said brochure transfer device includes at least one pair of tongs moving in a circular orbit and having at least one spring influenced leg urged in the direction of the tongs closing position, said leg being adapted to be moved by a stationary cam disc against the action of said spring into its open position so that said tongs in their open condition seize a protruding portion of a brochure at the discharge end of said brochure supplier, and means causing a subsequent closing of said tongs which in their closed condition are moved to the transfer station to the brochure conveyor where they are again opened.

4. A device according to claim 3, in which said brochure transfer device includes a rotary table, means for mounting said movable leg of said tongs on said rotary table perpendicularly pivotable with respect to the plane of said rotary table, and another leg of said tongs carrying at its free end a roller which during the rotation of said rotary table engages the periphery of said stationary cam disc.

5. A device according to claim 4, including a cam disc (11) disposed in spaced parallel relation to said rotary table and being rigidly connected with it, said cam disc being provided with a control cam which cooperates with a projecting lever arm of said clamping pockets of said brochure conveyor so as to open said clamping pockets in the region of the transfer station and to release them on further rotation of said rotary table.

6. A device according to claim 5, including a follower cam arranged on said cam disc (11) and engaged by a cam follower of a stationary cam disc (9) in such a manner that said follower cam slides behind said brochures held by said tongs at the transfer station to the clamping pockets of said brochure conveyor so as to support the portion of the brochure which is not held by said tongs, and means for subsequently causing said follower cam to pivot into a retracted position as soon as said brochure has been transferred by said transfer device to said clamping pocket of said brochure conveyor.

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