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Stolzmann et al.

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[54] **DEVICE FOR REMOVING PACKAGING BAGS IN STACKS FROM A COLLECTOR LOCATED DOWNSTREAM OF THE DELIVERY DRUM OF A PACKAGING BAG MACHINE**

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[52] **U.S. Cl.** ..... **214/1 BD,** 93/93 R

[51] **Int. Cl.** **B31b 1/98**

[58] **Field of Search** ..... 214/1 BD, 147 T; 93/93 R, 93 DP, 93 C

[56] **References Cited**

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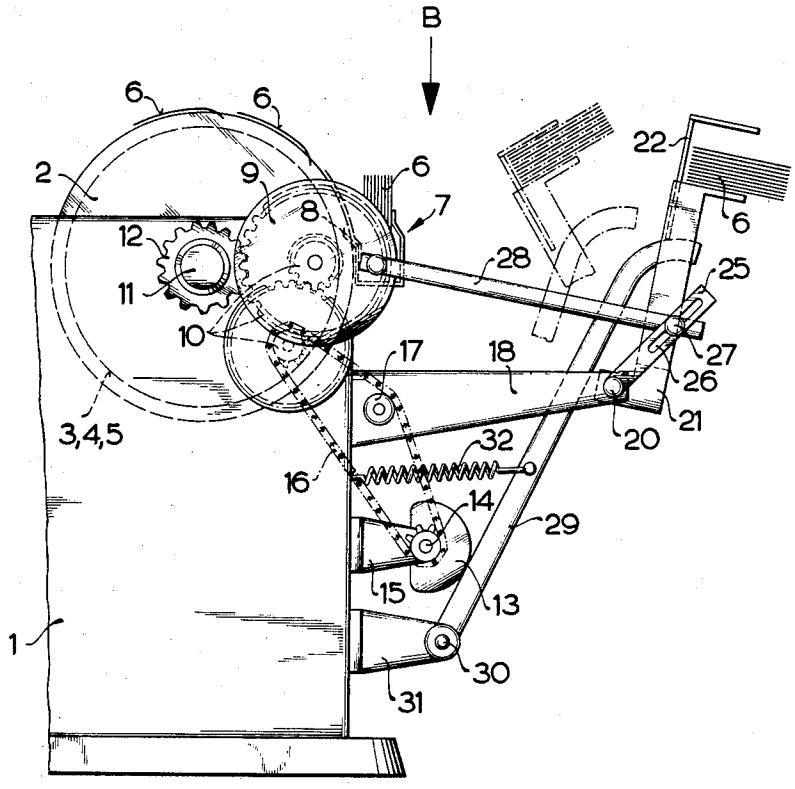
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Primary Examiner—Gerald M. Forlenza
Assistant Examiner—George F. Abraham
Attorney—Neil F. Markva et al.

[57] **ABSTRACT**

A device for removing packaging bags in stacks from a collector located downstream of the delivery drum of a packaging bag machine, wherein a U-shaped gripper, the free ends of the legs of which are bent in the direction towards the collector, co-operates with a collector arranged downstream of the delivery drum of the packaging bag machine. The gripper is displaceably guided by its legs owing to tension from helical springs acting on its web within one of the end walls of a substantially frame-shaped arm capable of being rotatably displaced in a vertical plane by means of a driven eccentric disc. The gripper is displaceable by a lever arm controlled by a driven cam with a view to clamping the stack of packaging bags on the gripper between the bent legs of the latter and the frame-shaped arm which is capable of being rotatably displaced or with a view to releasing the stack of packaging bags, respectively.

1 Claim, 4 Drawing Figures



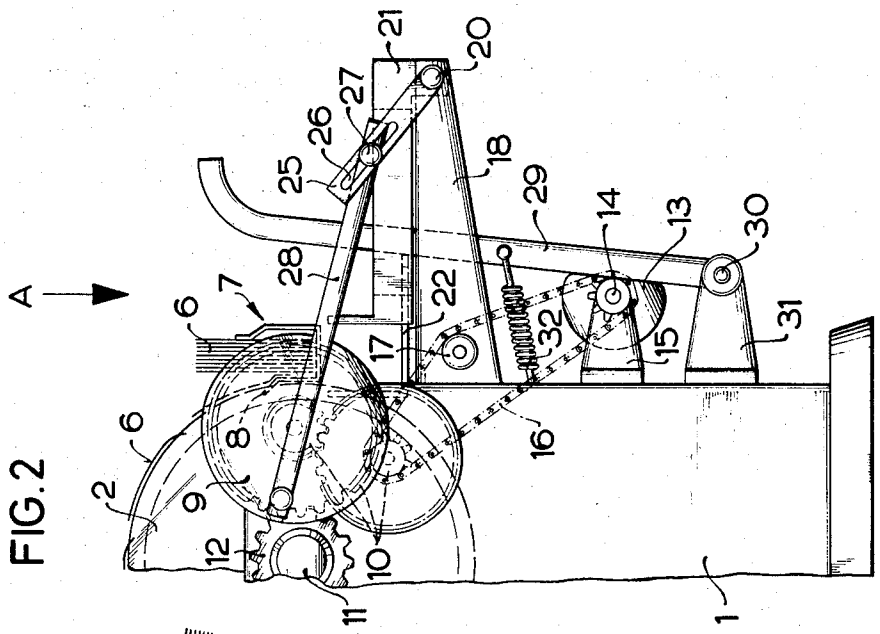

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FIG. 2

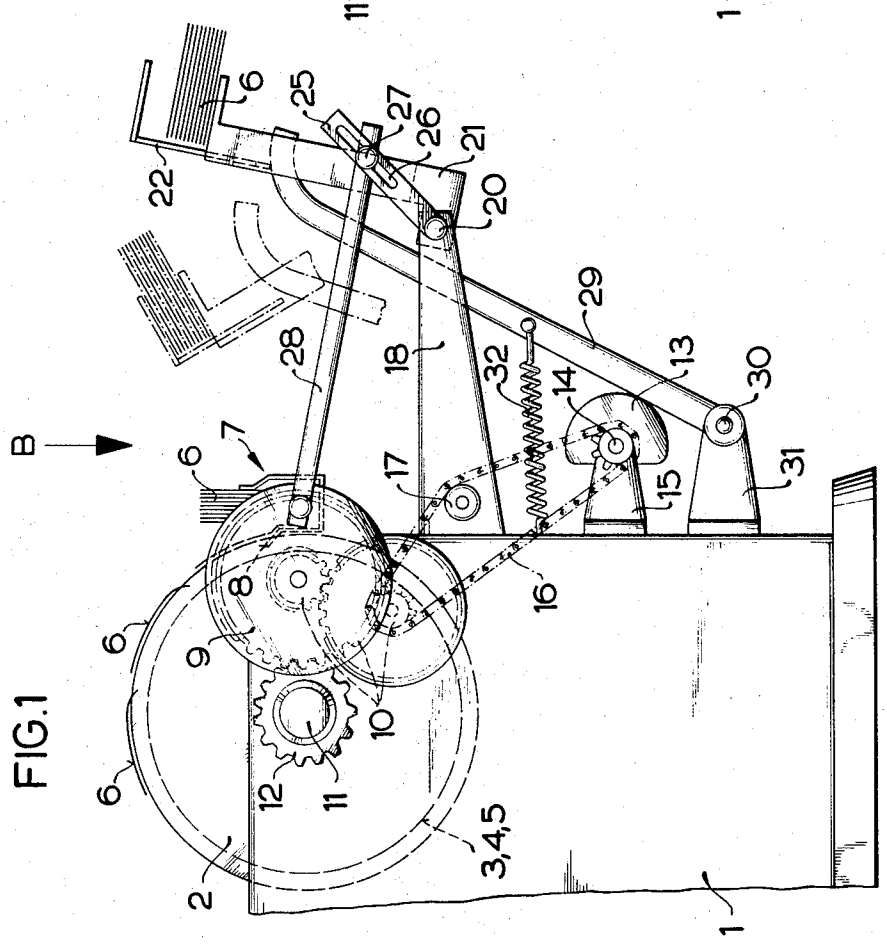

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FIG. 1

FIG.4

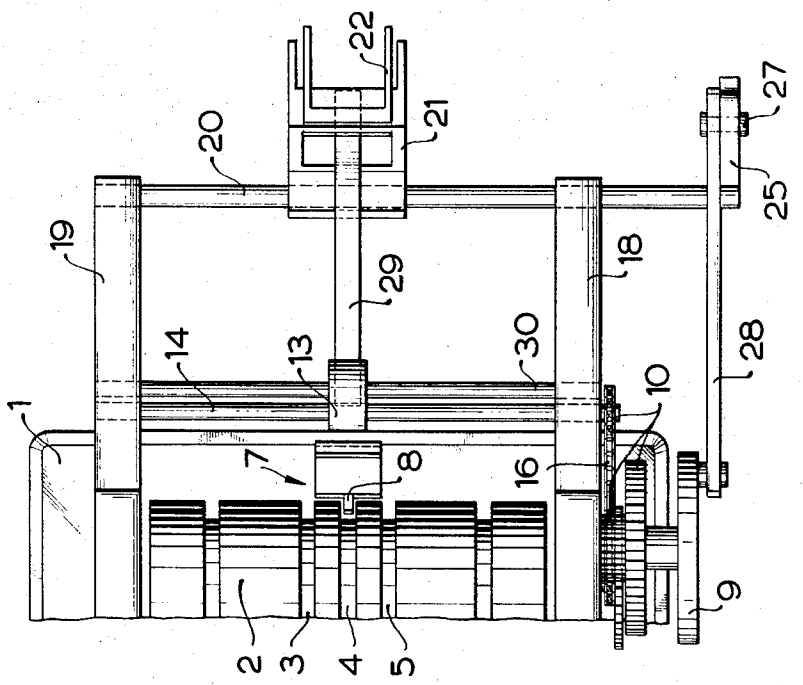
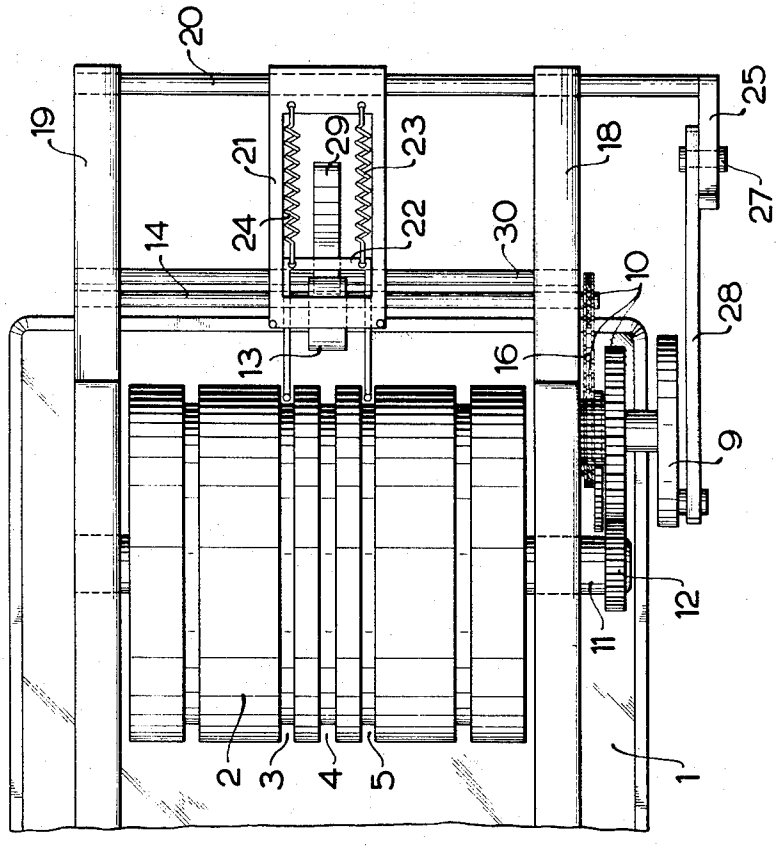

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FIG.3


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DEVICE FOR REMOVING PACKAGING BAGS IN STACKS FROM A COLLECTOR LOCATED DOWNSTREAM OF THE DELIVERY DRUM OF A PACKAGING BAG MACHINE

BACKGROUND OF THE INVENTION

This invention relates to a device for removing packaging bags in stacks from a collector located on the downstream side of the delivery drum of a packaging bag machine, e.g., towards a station for further processing.

Such devices are known. With one known device the individual stacks of packaging bags are taken up at the collector by grippers arranged on vertically circulating conveyor chains, each stack of packaging bags being clamped to the said grippers. After reversal of the conveyor chain the individual stacks of packaging bags having been previously unclamped slide on to a table surface or the like. Such conveyor devices are of relatively complex design and costly to produce, in particular because a large number of grippers with corresponding clamping elements are necessary in order to achieve the required rate of transportation.

SUMMARY OF THE INVENTION

It is the object of the invention to simplify the conveyor devices of the type described above.

To attain this object the present invention provides a device for removing packaging bags in stacks from a collector located downstream of the delivery drum of a packaging bag machine, which comprises a U-shaped gripper arranged for co-operation with a collector and having legs connected at one end by a web and bent at the other end in the direction towards said collector; a rotatable eccentric disc; a substantially frame-shaped arm having side and end walls and arranged to be rotatably displaced in a vertical plane when the eccentric disc is rotated, the legs of said U-shaped gripper being displaceably guided in one of the end walls of said substantially frame-shaped arm; helical springs arranged to act between the web of the U-shaped gripper and the other end wall of the substantially frame-shaped arm; a rotatable cam, and a lever arm controlled by said rotatable cam and arranged to displace said U-shaped gripper with a view to clamping or releasing a stack of packaging bags on the U-shaped gripper between the bent leg ends of the latter and the substantially frame-shaped arm.

With the device proposed by the invention the U-shaped gripper merely carries out an angular movement in order to pick up a stack of packaging bags and to deposit it e.g., on a table surface. Hence, owing to the short conveying distance only a single gripper and, accordingly, only a single clamping device is required for the stack of packaging bags taken up. The design of the device proposed by the invention is therefore considerably simpler than that of the known conveying devices, and its manufacture is less costly.

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, in which:

FIG. 1 is a side view of a device according to the invention with the U-shaped gripper in its final position;

FIG. 2 is a similar view of the device with the U-shaped gripper in its initial or starting position;

FIG. 3 is a top plan view of the device in the direction of arrow A in FIG. 2, and

FIG. 4 is a top plan view of the device in the direction of arrow B in FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the drawings, the reference numeral 1 designates the frame of a packaging bag machine, of which apart from the frame 1 only the driven delivery drum 2 is shown. The delivery drum 2 is mounted on a shaft 11 and has three circular grooves 3, 4 and 5 located next to one another at a certain distance. The reference numeral 6 designates packaging bags which drop from the delivery drum 2 on to a U-shaped collector 7. One of the legs of said U-shaped collector 7 bearing the reference numeral 8 is bent at its free end, the bent part projecting into the groove 4 of the delivery drum 2. Hence frictionless dropping of the packaging bags 6 on to the U-shaped collector 7 is ensured. The web which connects the legs of the U-shaped collector 7 is so dimensioned that the packaging bags 6 project laterally therefrom. A rotatable eccentric disc 9 is mounted on the frame 1 and is driven by means of a pinion 12, firmly mounted on the shaft 11 of the delivery drum 2, via a change-speed gear 10. A rotatable cam 13 is firmly mounted on a horizontal shaft 14. The ends of the shaft 14 are supported in bearing brackets 15 provided on the frame 1. The cam 13 is driven by means of the change-speed gear 10 via a chain 16 which is tensioned with the aid of a jockey roller 17. Two brackets 18 and 19 are secured to the frame 1 so as to extend at a distance from one another, a shaft 20 extending through the free ends of said brackets. The shaft 20 carries a substantially frame-shaped arm 21 having side and end walls. In one of the end walls of the substantially frame-shaped arm 21 there are the legs of a U-shaped gripper 22 displaceably guided, whereas the other end wall of the frame-shaped arm 21 is firmly mounted on the shaft 20. The U-shaped gripper 22, which in its initial or starting position is below the collector 7, is subject to tension from two helical springs 23 and 24, one end of said springs being attached to the web of the U-shaped gripper 22 and the other to the end wall of the frame-shaped arm 21 that is firmly mounted on the shaft 20. The legs of the U-shaped gripper 22 have their free ends bent upwards, i.e., in the direction towards the collector 7, these bent up ends enabling the gripper 22 to reach in its initial position into the grooves 3 and 5 of the delivery drum 2. That end wall of the frame-shaped arm 21 which faces the bent up ends of the legs of the U-shaped gripper 22 is provided on both ends with continuations facing upward.

To one end of the shaft 20, i.e., the end with which the said shaft projects from the bracket 18, one end of a bar 25 is firmly attached, the said bar 25 having an elongated slot 26. Within the elongated slot 26 a bolt 27 is displaceably guided, it being possible to fix the said bolt in a selected position. The reference numeral 28 designates a connecting rod between the eccentric disc 9 and the bolt 27. The U-shaped gripper 22 is controlled by means of a lever arm 29 one end of which is rotatable about a pin 30 passing through bearing brackets 31 provided on the frame 1. The lever arm 29 is subject to tension from a pre-stressed helical spring 32 one end of which is secured to the frame 1, whereas the other end is fixed to the lever arm 29. The lever arm 29

is controlled by means of the rotatable cam **13** and is held against the latter by means of the helical spring **32.** The other end of the lever arm **29** is bent and passes with its bent end through the frame-shaped arm **21.**

The device described above operates as follows:

When the frame-shaped arm **21** driven by the eccentric disc **9** is rotatably displaced, the U-shaped gripper **22** lifts from the U-shaped collector **7** the packaging bags **6** which have dropped from the delivery drum **2** on to the collector **7** by gripping from below the ends of the packaging bags **6** which project in relation to the collector **7.** Then the lever arm **29** swings away from the U-shaped gripper **22** after having pushed forward the U-shaped gripper **22** in the direction toward the delivery drum **2,** by exerting pressure on its web against the force of the helical springs **23** and **24.** This causes the previously stressed and now relaxing helical springs **23** and **24** to pull up the gripper **22** until the stack of packaging bags is located between the bent ends of the legs of the gripper **22** and the upward facing continuations of the arm **21.** Shortly before completion of an angular movement by the frame-shaped arm **21** with its gripper **22,** the lever arm **29** pushes the gripper **22** further in the direction toward the delivery drum **2** as a result of which the packaging bags **6** slide from the gripper **22** e.g., on to a table surface. Then the frame-shaped arm **21** with its gripper **22** is again swung into its initial position, whereupon the said process is again repeated.

Of course, the implementation of the invention is not limited to packaging bags but it may also be used for letter envelopes and so on.

What is claimed is:

1. A device for removing packaging bags in stacks from a collector located downstream of the delivery drum of a packaging bag machine, comprising

a. a U-shaped gripper arranged for co-operation with a collector and having legs connected at one end by a web and bent at the other end in the direction towards said collector;

b. a rotatable eccentric disc;

c. a substantially frame-shaped arm having side and end walls and arranged to be rotatably displaced in a vertical plane when the eccentric disc is rotated, the legs of said U-shaped gripper being displaceably guided in one of the end walls of said substantially frame-shaped arm;

d. helical springs arranged to act between the web of the U-shaped gripper and the other end wall of the substantially frame-shaped arm;

e. a rotatable cam, and

f. a lever arm controlled by said rotatable cam and arranged to displace said U-shaped gripper with a view to clamping or releasing a stack of packaging bags on the U-shaped gripper between the bent leg ends of the latter and the substantially frame-shaped arm.

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