APPARATUS FOR PACKING FRUIT

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ABSTRACT

Fruit is automatically packed in successive sections of a continuous flexible tube which is mounted on a downwardly inclined supply and guide pipe, the tube having an upper, stored section remote from the lower open end of the pipe. Selectively operable brake shoes are mounted between the stored tube section and the open pipe end for gripping successive tube sections and for moving them in the direction of the open pipe end whereby these sections are drawn from the stored tube section, the brake shoes being selectively operable to engage these sections and to brake them.

5 Claims, 3 Drawing Figures
1 APPARATUS FOR PACKING FRUIT

The present invention relates to improvements in apparatus for automatically packing fruit and the like into successive sections of a continuous flexible tube.

Known apparatus of this type comprises a downwardly inclined supply and guide pipe for the fruit and the like. The pipe has a lower open end and the flexible tube is mounted on the pipe and has an upper, stored section remote from the pipe end. A brake is provided for holding the successive tube sections on the pipe and means is provided for drawing these tube sections from the stored tube section. This means may comprise driven gripping rollers pivotal into engagement with the tube on the pipe to draw the tube therealong. This requires a power supply for driving the rollers as well as for pivoting them into engaging position. Slippage frequently occurs between the driven rollers and the flexible tube engaged thereby.

It has also been proposed to store the upper tube section on a second pipe adjustably mounted on the supply and guide pipe, the successive tube sections being drawn from the stored tube section by relative movement between the two pipes. This arrangement is cumbersome and also requires considerable power for operation.

It is the primary object of this invention to simply apparatus of this general type by combining the tube brake and draw means in a single structure. Thus, the brake itself may simply be moved parallel to the pipe to serve also as the draw means.

The above and other objects are accomplished in accordance with the invention means mounted between the stored tube section and the open pipe end for gripping successive tube sections and for moving the successive tube sections in the direction of the open pipe end whereby the successive tube sections are drawn from the stored tube section. The tube gripping and moving means includes means selectively operable to engage the successive tube sections so as to brake them.

In a preferred embodiment of the present invention, the tube gripping and moving means comprises a pair of brake shoes associated with the supply and guide pipe and at least partially encompassing the successive tube sections. The selectively operable engaging means comprises an actuating linkage connected to the brake shoes and automatic actuating means for the linkage for selective engagement of the brake shoes with the successive tube sections. A guide extends parallel to the pipe and reciprocably supports the brake shoe actuating linkage for moving the brake shoes in a direction parallel to the pipe.

According to preferred feature, a support ring for the successive tube sections is glidably mounted on the supply and guide pipe between the pipe and the brake shoes whereby the successive tube sections extend between the support ring and the brake shoes.

The packing of the fruit and the like will be expedited by mounting a blocking device in the pipe upstream of the tube gripping and moving means. The blocking device is arranged for movement between a pipe blocking and an open position whereby fruit and the like delivered to the pipe may be collected therein when the blocking device is in the blocking position and is released into the successive tube sections when the blocking device is in the open position.

The above and other objects, advantages and features of the present invention will become better understood by reference to the following detailed description of a now preferred embodiment thereof, taken in conjunction with the accompanying drawing wherein

FIG. 1 is a schematic side view, partly in section, of an embodiment of this invention;

FIG. 2 is an end view of the brake shoes and actuating linkage therefor, the pipe and support ring for the flexible tube being shown in transverse section; and

FIG. 3 shows the upper portion of a modified supply and guide pipe with a blocking device.

Referring now to the drawing, FIG. 1 shows a support frame 1 with a downwardly inclined base, a support bracket 20 fixedly mounting the downwardly inclined supply and guide pipe 2 on the frame. The pipe has a lower open end 6 and a flexible packing tube is mounted on the pipe, with a pleated tube section 3 being stored on the pipe remote from outlet 6. Successive tube sections 4 are drawn from the stored tube section 3 in a manner to be described hereinafter, the successive tube sections being guided over a ring 5, which is affixed to the pipe, as they are drawn from the stored tube section. The ring 5 circumferentially stretches and tensions the tube.

Mounted between tube guide ring 5 and the pipe outlet end 6 is a means 7 for gripping the successive tube sections guided over ring 5 and for moving them in the direction of open pipe end 6 whereby these tube sections are drawn from the stored tube section 3. As most clearly shown in FIG. 2, this tube gripping and moving means is arranged to operate selectively as a brake for the tube. It comprises a pair of diametrically opposed, cooperating brake shoes 8, 8 associated with the supply and guide pipe 2 and partially encompassing the successive tube sections 4. The brake shoes are selectively operable to engage these tube sections so as to brake them, an actuating linkage being connected to the brake shoes for this purpose.

The brake shoes are fixedly mounted on brackets 21, each bracket having an outer end linked to one end of a respective one of a pair of two-armed links 9, 9 whose other ends 12, 12 are linked to an automatic actuating mechanism 13 for pivoting the two-armed links 9 in the direction of arrows 14, 14 about fulcrums 22, 22 of the links. Upon such pivoting movement, the actuating linkage will press the brake shoes 8 into engagement with a respective tube section 4 so as to brake it and hold it in fixed position on pipe 2. When the actuating mechanism 13 is operated to move the link ends 12 in the opposite direction, the brake shoes are disengaged from the tube.

The actuating mechanism 13 may be electrically, hydraulically or pneumatically operated and may consist, for instance, if a double-acting hydraulic or pneumatic cylinder-and-piston device whose piston rods are linked to link ends 12. Operation of the actuating mechanism is timed to the packing cycle for braking the tube section 4 when it is being packed and then permitting the packed tube section to be drawn from the stored tube section in a continuously proceeding packing operation well known per se.

As best shown in FIG. 1, a slide 10 supports links 9, 9, being linked to their fulcrums 22, 22, the slide being glidably mounted on a pair of guide rods 11 which extends parallel to the pipe 2 and is fixedly supported on support frame 1. In this manner, the entire mechanism
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is reciprocable in a direction parallel to pipe 2 so that this mechanism, when the brake shoes are disengaged from tube section 4, may move it so as to draw it from tube section 3. To make certain that the tube section 4 is properly gripped during this movement, a support ring 15 is rigidly mounted on the pipe between the pipe and the brake shoes whereby the successive tube sections 4 extend between support ring 15 and the brake shoes, the brake shoes being of saucer-shaped cross section (see FIG. 1) to cooperate with the support ring for gripping the tube section therebetween and pulling it along in the direction of movement of slide 10.

FIG. 3 shows a preferred feature of the apparatus. As illustrated, a blocking device shown as pivotal trap or flap 17 is mounted in the upper pipe portion 16 upstream of the mechanism 7 and the stored tube section 3, and is arranged for movement between a pipe blocking position, shown in the drawing, and an open position. The trap is shown to be a simple bell crank lever pivoted to a lug 23 affixed to the pipe 2, the other arm of the lever being linked to a control 19 which may be solenoid-operated, for instance, to reciprocate the flap 17 in the direction of arrow 24 between its blocking and open position. A port 25 in the wall of pipe 2 enables the flap to be mounted and moved in the pipe.

In operation, batches of fruit 18 are weighed, counted or otherwise apportioned in any desired manner, and the batches are successively fed into the upper end of pipe 2 while the flap 17 blocks passage through the pipe, as shown in FIG. 3, so that each batch of fruit or any other charge is collected at this point of the pipe. During this period, the brake shoes 8 are released and the slide 10 is moved in the direction of pipe outlet 6 to draw the tube section 4 (which has been packed with a batch of fruit in the preceding cycle) from the stored tube section 3. As shown in FIG. 1, the open outer end of tube section 4 has previously been tied together or otherwise closed to receive and hold the batch of fruit charged into it. After the packed tube section 4 has been drawn down by mechanism 7 and has moved over pipe outlet 6, it is cut off from the continuous tube and its open end is closed again. The brake shoes 8 are now applied and the flap 17 is opened to empty the collected batch 18 into tube section 4. This proceeds almost instantaneously, since the inclined pipe operates like a chute, whereupon the pipe is blocked again, the brake is disengaged and the slide 10 is moved down to repeat the cycle. Since each batch 18 is collected while the previously packed batch is drawn off the pipe, no time is lost and the packing operation proceeds with utmost speed.

I claim:

1. In an apparatus for packing fruit and the like into successive sections of a continuous flexible tube, comprising

a downwardly inclined supply and guide pipe for the fruit and the like,

b the flexible tube being mounted on the pipe and having an upper, stored tube section remote from the pipe end; the improvement comprising

2 means mounted between the stored tube section and the open pipe end for gripping successive tube sections and for moving the successive tube sections in the direction of the open pipe end whereby the successive tube sections are drawn from the stored tube section, the tube gripping and moving means including

a means selectively operable to engage the successive tube sections so as to brake them.

2. The apparatus of claim 1, further comprising means for reciprocating the tube gripping and moving means in a direction parallel to the pipe.

3. The apparatus of claim 2, wherein the tube gripping and moving means comprises a pair of brake shoes associated with the supply and guide pipe and at least partially encompassing the successive tube sections, the selectively operable engaging means comprises an actuating linkage connected to the brake shoes and automatic actuating means for the linkage for selective engagement of the brake shoes with the successive tube sections, and a guide extending parallel to the pipe and reciprocably supporting the brake shoe actuating linkage.

4. The apparatus of claim 3, further comprising a support ring for the successive tube sections gildably mounted on the supply and guide pipe between the pipe and the brake shoes whereby the successive tube sections extend between the support ring and the brake shoes.

5. The apparatus of claim 1, further comprising a blocking device mounted in the pipe upstream of the tube gripping and moving means and arranged for movement between a pipe blocking and an open position whereby fruit and the like delivered to the pipe may be collected therein when the blocking device is in the blocking position and is released into the successive tube sections when the blocking device is in the open position.

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