July 29, 1952 E. N. BRODEN 2,604,687

APPARATUS FOR PACKING OF RIBBON OR FILAMENTARY MATERIAL

Filed Dec. 1, 1950 2 SHEETS—SHEET 1

Fig. 3.

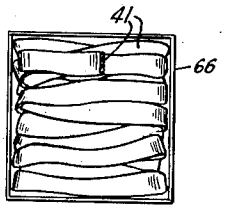
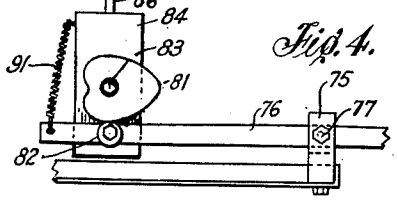


Fig. 1.

Fig. 4.



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Fig. 2.

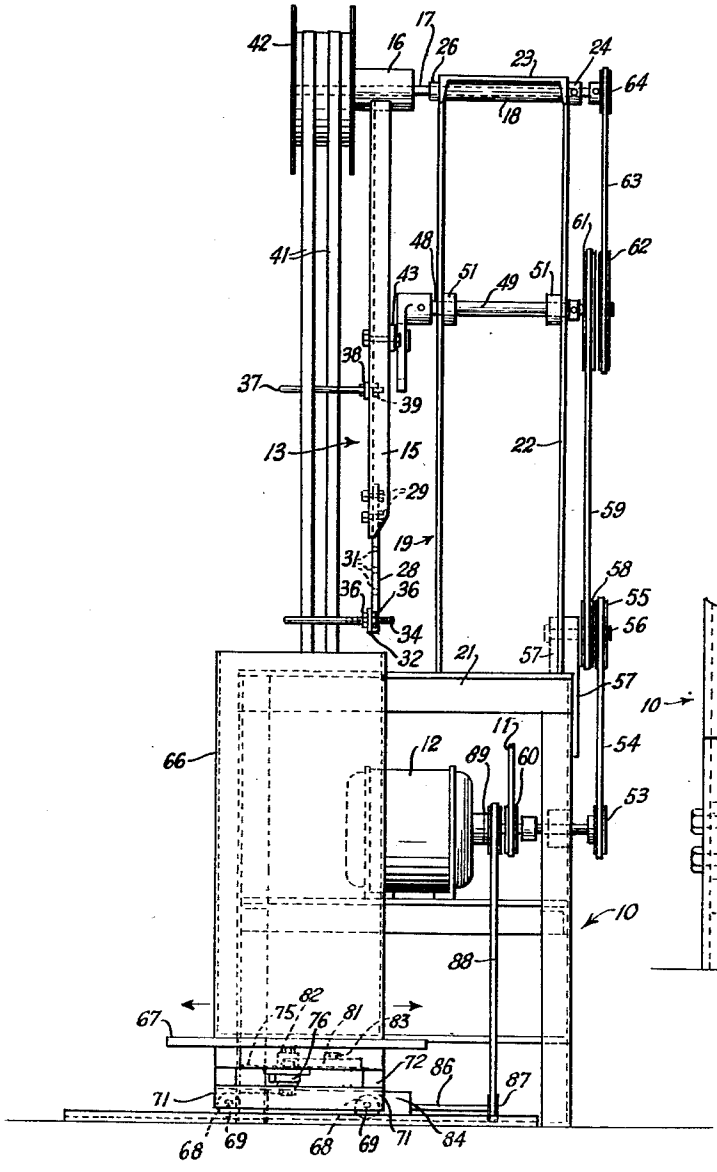
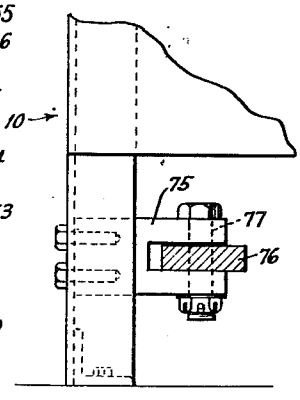


Fig. 5.



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APPARATUS FOR PACKING OF RIBBON OR FILAMENTARY MATERIAL

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Application December 1, 1950, Serial No. 198,666

3 Claims. (Cl. 28—21)

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This invention relates to the packing of continuous strip material, such as rubber thread, or ribbons of material comprising units of incompletely cut thread.

In the packing of rubber threads, as gang-cut from a ribbon by circular cutting knives, the separate threads are packed manually by an operator, who continuously knits the emerging bundle of strands into a succession of slip knots and deposits the knotted skein into its shipping box. In ultimate use of the rubber threads, as for feeding into a thread-covering machine, the bundle of strands slips out of knitted condition, as paid out.

In the production of threads which are retained in ribbon form by virtue of incomplete cutting by the circular knives, as described in my copending application, Serial No. 214,173, filed March 6, 1951, manual attention in the packing is unnecessary since there is no tendency for the threads to tangle. However, it has been found that the ribbon, if fed into the package from a fixed guide, tends to heap up in a given portion of the box, with the result that the available space in the box is not fully utilized. Furthermore, in subsequent handling, the ribbon rearranges itself in the package in such manner that eventual, automatic dispensing does not proceed in the desired manner.

By the present invention, both the guide means leading the ribbon to the package and the package itself are reciprocated cyclically, in a manner to fill the package with even distribution of the ribbon and to provide for subsequent smooth and easy withdrawal, without tangling.

It is therefore an object of the invention to provide an automatic packing means for continuous length materials which will achieve optimum employment of available space in packages. A further object is to provide for packing such material in a manner that will ensure subsequent dispensing in untangled condition. More particularly, it is an object to pack continuous strip material by oscillating both the guide means for the material and the container in which it is being packed.

These and other ends will be apparent to those skilled in the art, from the accompanying specification, as illustrated in the drawings, in which:

Fig. 1 is a front elevational view of the guide mechanism for packing,

Fig. 2 is a side elevational view of the mechanism of Fig. 1, as seen from the right of that figure,

Fig. 3 is a top view of a filled container, showing

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the arrangement of the ribbon-like material when packed in the container by the apparatus of Figs. 1 and 2,

Fig. 4 is a view of a detail, as seen along the line 4—4 of Fig. 1, and

Fig. 5 is an enlarged view of a detail, as seen along the line 5—5 of Fig. 1.

Referring to the drawings by characters of reference, there is shown, in general outline, a framework 10, the prime purpose of which is to accommodate the several elements of a thread-cutting machine, of the type employing circular knives. Since the particular thread-cutting means employed forms no necessary part of the present invention, most of the elements thereof are not shown in the drawing.

A motor (not shown), which drives the thread-cutting mechanism, connects through a belt 11 with a speed reducer 12, which has operative connections with the elements which distribute the product of the machine as it is laid in its packing container, as will be explained.

The distributing elements comprise an upper, rocker arm 13, which moves the ribbon back and forth in one plane, and a lower rocker arm 14, which moves the packaging container back and forth transversely to the plane of motion of upper arm 13. The upper arm comprises a channel member 15, having a hub 16 at its upper end freely rotatable on a shaft 17, which is rotatable in a sleeve 18 carried by a support 19, of channel section. The latter is welded to an angle bracket 21 secured to the framework 10 and comprises an oblique arm 22 and a horizontally extending arm 23. Sleeve 18 is welded in place in openings in the walls of arm 23 and shaft 17 is retained against axial motion by collars 24, 26.

At its lower end, rocker arm channel 15 carries an extension 27 of T form. The vertical leg 28 of this extension is secured to channel 15 by a pair of bolts 29 and leg 28 is further provided with a plurality of extra perforations 31 so that its position may be adjusted, vertically. The horizontal arm 32 of the T has a pair of long slots 33, accommodating eye bolts 34, which are secured in adjusted position in the slots by pairs of nuts 36. The ribbon or other material being packed passes through the openings of the eye bolts and thus is caused to move back and forth with the rocker arm, so that the material is distributed instead of piling up in a heap. Two eye-bolt guides are provided because the thread-cutting machines are commonly equipped with cutters for simultaneously cutting two ribbons into threads, but it will be understood that a rocker

arm may be employed having a single guide means.

Auxiliary guide means for the ribbon are provided in a pair of pins 37, secured near the ends of a transverse arm 38 secured by bolts 39, medially of channel 15.

The ribbon 41, leaving the cutting mechanism, is carried forward by a drum 42, keyed to shaft 17, passes around the outer sides of guide pins 37, and thence through the eye bolts 34.

Arm 13 is oscillated by a link 43 pivoted to the arm by a bolt 44 and to a crank arm 46 by a pin 47. The crank arm is secured to a shaft 48, mounted similarly to shaft 17 in a sleeve 49 carried by support arm 22, and fixed against axial motion by collars 51. Pin 47 is adjustably secured in a slot 52 in the crank arm, so that the effective stroke of the latter may be varied. Also, bolt 44 may be secured in any one of a series of perforations 45 in arm 13.

Crank 46 and drums 42 are rotated by speed reducer 12 through a drive system, as follows: A pulley 53 on the speed reducer shaft drives a belt 54, which drives a pulley 55 keyed to a shaft 56 journaled in a bracket 57 secured to framework 10. A second pulley 60 on the motor shaft accommodates belt 11 from the motor. Also keyed to shaft 56 is a pulley 58, driving a belt 59, which in turn drives a pulley 61, keyed to shaft 48. Also keyed to shaft 48 is a pulley 62 driving a belt 63, which drives a small pulley 64, keyed to shaft 17. Thus, shafts 48 and 17 are both rotated by the motor, with shaft 17 rotating at a faster rate than the crank shaft 48, and the ribbons are carried to their containers by pulley 42, as rocker arm 13 oscillates to lay the ribbon in a sinuous arrangement in its packing box.

The mechanism for reciprocating the packing box is as follows: The packing boxes 66 are placed on a dolly 67 having wheels 68 journaled on a pair of axles 69 carried by angle irons 71, secured to lugs 72 depending from the underside of the dolly platform. Wheels 68 are guided in a pair of tracks 73 of channel section, which are screw fastened to the floor 74, and are arranged perpendicularly to the plane of the T member 27.

The dolly is reciprocated along tracks 73 by an arm 76, medially pivoted on a fixed pin 77, carried by a forked block 75 which is bolted to a leg of the framework 10. The outer end of arm 76 has a long shot 78 receiving a headed pin 79 secured to the underside of the dolly. As arm 76 oscillates on pin 77, the dolly is moved back and forth along tracks 73. Oscillation of the arm is effected by a cam 81 which is engaged by a follower roller 82 on the inner end of arm 76. The cam is mounted on a vertical shaft 83, which forms the output of a reduction gearing unit 84. The input shaft 86 of the latter carries a pulley 87, which is driven by a belt 88 connected to a pulley 89 on the motor shaft. A coil spring 91, attached to the inner end of arm 76, and to the gear reduction unit 84, keeps follower roller 82 in contact with the cam at all times. With the cam in the position shown, arm 14 is at the middle position of its swing.

As the ribbons are paid out, guides 34 carry them back and forth to lay them in a pattern running from side to side in the boxes, and movement of the dolly by arm 76 moves the boxes continually beneath the descending ribbon so that the ribbons are laid in sinuous fashion, progressing back and forth along the length of the box, with a resulting pattern as shown in Fig. 3. This fully utilizes the available space in the boxes, prevents tangling, and ensures easy removal by automatic machinery.

While a certain preferred embodiment of the invention has been shown and described, the invention is not limited thereby, for changes in the size, shape, and arrangement, for instance, of the various elements may be resorted to, without departing from the spirit or scope of the appended claims.

What is claimed is:

1. A distributing device for the packing of continuous lengths of material into containers, comprising a rocker arm having guide means for the material, means to oscillate said rocker arm, a movable support for containers located beneath said rocker arm, track means constraining said support to motion in a straight line, transverse to the plane of oscillation of said rocker arm, a lever mounted for rotation on a fixed pivot, and pivoted to said movable support, and means to oscillate said lever on said fixed pivot, the movements of said rocker arm and said lever being synchronized.

2. A distributing device for the packing of continuous lengths of material into containers, comprising a rocker arm having guide means for the material, means to oscillate said rocker arm, a movable support for containers located beneath said rocker arm, track means constraining said support to motion in a straight line, transverse to the plane of oscillation of said rocker arm, a lever mounted for rotation on a fixed pivot, and pivoted to said movable support, and cam means to oscillate said lever on said fixed pivot, the movements of said rocker arm and said lever being synchronized.

3. A distributing device for the packing of continuous lengths of material into containers, comprising a rocker arm having guide means for the material, means to oscillate said rocker arm, a movable support for containers located beneath said rocker arm, track means constraining said support to motion in a straight line, transverse to the plane of oscillation of said rocker arm, a lever mounted for rotation on a fixed pivot, and pivoted to said movable support, and means to oscillate said lever on said fixed pivot, said means to oscillate said rocker arm, and said means to oscillate said lever being connected to a common source of power to synchronize the movements of said rocker arm and said lever.

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