APPARATUS FOR PACKAGING RUBBER BANDS
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This invention relates to a method of packaging rubber bands and apparatus for carrying the method into effect.

Therefore, rubber bands were packaged and sold by the pound, box or other container in a loose jumbled condition thereby rendering it difficult to readily select one or more bands for use.

One of the objects of the present invention is a novel method of assembling rubber bands on a card in a neat and orderly arrangement wherein the card is provided with an aperture for facilitating the hanging thereof in an accessible position for ready removal of one or more of the bands from the card without disarranging the remaining bands thereon.

A further object of the invention is the provision of novel apparatus for assembling a predetermined number of rubber bands on a card including a rectangular body portion on which the bands are assembled, opposite end portions of greater width than the body portion for retaining the bands on the body portion and wherein one of said end portions is provided with an aperture for receiving a hanging member projecting from a wall or other surface, thereby providing ready access to the bands for removal of one or more thereof without disturbing the remaining bands on the card.

Other objects and advantages of the invention will become apparent in the course of the following detailed description, taken in connection with the accompanying drawings, wherein—

FIG. 1 is a vertical sectional view, partially in elevation, of means for impaling a plurality of rubber bands on an elongated rod.

FIG. 2 is a horizontal sectional view of the impaling means of FIG. 1 as observed in the plane of line 2—2 thereof.

FIG. 3 is a top plan view of means for transferring a predetermined number of rubber bands from the rod to band expanding means.

FIG. 4 is a side elevational view of the structure shown in FIG. 3.

FIG. 5 is a fragmental vertical sectional view as observed in the plane of line 5—5 on FIG. 4.

FIG. 6 is a view partly in elevation and partly in vertical section and disclosing the said predetermined number of rubber bands in operative position for expansion thereof.

FIG. 7 is a view corresponding with the left hand portion of FIG. 6 and showing the said predetermined number of rubber bands in expanded position and with a band retaining card being inserted within the expanded bands.

FIG. 8 is a view corresponding to FIG. 7 but wherein the rubber bands are retracted onto the card.

FIG. 9 is a transverse sectional view as observed in the plane of line 9—9 on FIG. 6, on a larger scale.

FIG. 10 is a transverse sectional view as observed in the plane of line 10—10 on FIG. 7, on an elongated scale.

FIG. 12 is a perspective view of the card with said predetermined number of rubber bands supported thereon.

With reference first to FIGS. 1 and 2, wherein is disclosed the first method step in the assembling of rubber bands on a card, a vertically disposed hopper 10 is suitably supported as by vertical leg members 11 from a floor or base 12.

The hopper 10 preferably comprises an upper open ended cylindrical member 13 having a laterally swingable door 14 and the hopper and door are preferably of screen wire as indicated, thereby providing inspecting vision of operation of bands within the hopper.

The hopper further comprises a lower frusto-conical member 15 whose upper and larger end communicates with the lower end of the cylindrical member 13 and through whose lower and smaller end extends a vertically disposed tapered air nozzle 16 of an air blower 17. A vertical pipe 18 is disposed within the hopper centrally thereof and which comprises a lower cylindrical portion 19 of substantially greater diameter than the upper portion thereof and into the lower end of which the end of nozzle 16 is disposed.

The cylindrical portion 19 is retained in position within the hopper as by means of a pair of diametrically opposed plates 20 each having end flanges 21 which are secured to the hopper 10 and the cylindrical portion 19.

The pipe 18 extends upwardly within the hopper 10 and the upper end portion of the pipe is bent through an angle of 180° thereby providing a gooseneck 22 which opens downwardly on an axis parallel with and in spaced relation to the major portion of the pipe 18.

A pointed steel rod 23 is vertically disposed within the hopper 10 with the pointed end thereof immediately below the end of the gooseneck 22 and the rod is disposed adjacent the door 14 for a purpose as will later appear.

The lower end of the rod 23 is removably disposed within one of the plates 20.

As is indicated in FIG. 1, a mass of rubber bands B within the hopper 10 is subjected to a constant blast of air from the nozzle 16 whereby the bands B are blown upwardly into the pipe 18 and since the rod 23 is axially aligned with the opening in gooseneck 22, many of the bands emerging therefrom will move into the rod and while, as indicated in FIG. 1, some of the bands will pass by the rod, a continued operation will result in the rod being encircled by rubber bands throughout the length thereof.

As is indicated in FIGS. 3 and 4, the rubber band loaded rod is removed from plate 20 and withdrawn through the door 14 and same is placed in a horizontal position above a suitable work bench 24 wherein the base end of the rod is removably supported in a block 25 as by means of a screw 26.

The block 25 is disposed adjacent one end of the work bench 24 and at the opposite end thereof is fixed thereto the base 27 of a stationary spindle 28 and normally engaging the fixed spindle 28 in overlying relation thereto is a cooperating and movable spindle 29.

A vertically disposed rod 30 extends loosely through the work bench 24 and the spindle base 27 and whose upper end is secured to the spindle 29.

The rod 30 is provided with a fixed collar 31 and a coil spring 32 is disposed between the work bench 24
the collar 31 and which acts to normally hold the spindles 28 and 29 in contact as indicated in FIG. 4. A foot treadle 33 is disposed beneath the work bench 24 and said is pivoted at 34 intermediate its ends to a fixed bracket 35 providing a relatively short foot engaging end 36 at one side of pivot 34 and a relatively long end 37 at the opposite side of pivot 34 and which has its free end pivotally connected to the lower end of rod 30 as indicated at 38.

From FIG. 4 it will be seen that upon engagement of the foot of an operator with the end 36 of treadle 33, the spindle 29 will be moved vertically upwardly and away from the fixed spindle 28, as indicated in FIG. 7.

A combined weighing and band transfer means is disposed between rod 23 in FIGS. 3, 4 and 5 and the spindles 28 and 29 and which comprises a bracket 39 which is fixed to the work bench 24 in a position intermediate the rod 23 and the spindles 28 and 29.

The weighing means comprises a beam 40 provided with a slideable weight 41 and the band transfer means comprises a spindle 42 having one end thereof pivoted to one end of beam 40 as at 43 whereby same is capable of swinging movement about a vertical axis in alignment with the rod 23 or spindles 28 and 29 as is indicated in full and dotted lines in FIG. 3. It is to be observed at this point that the spindle 42 must be axially aligned with spindles 28 and 29 for transfer of the rubber bands thereto and a predetermined weight of bands on spindle 42 must prevail for this operation.

The second and third steps in the method are carried out by the structure disclosed in FIGS. 3, 4 and 6 wherein a predetermined number of rubber bands are transferred from the rod 23 to spindle wherein a determined number of bands is determined by the weighing means 40-41 and said predetermined number of bands are transferred to the spindles 28 and 29 when in their contacting position, as is shown in FIG. 6.

In the fourth step of the method treadle 33 is operated and spindles 28 and 29 are separated as in FIG. 7 with a resulting expansion of the rubber bands B in a relatively flat formation as shown in FIG. 10.

The fifth step of the method consists in inserting a card C into the expanded bands and which card has wide end portions c1 and c2 and a narrower body portion c3.

The sixth method step consists in relieving tension on the bands with a resulting engagement of the bands with the body portion c3 and which are retained in position by means of the wide end portions c1 and c2.

The finished product is shown in FIG. 12 with a predetermined number of rubber bands B supported on the card C which is provided with an aperture a for facilitating hanging thereof.

Having set forth the invention in accordance with a preferred structure embodiment thereof, what is claimed and desired to be secured by U.S. Letters Patent is:

1. Apparatus for disposing a predetermined number of rubber bands on a rectangular body portion of a card having opposed band retaining end portions, comprising means operatively to arrange a plurality of rubber bands on an elongated rod in co-axial relation thereto, means for supporting said rod with said plurality of rubber bands substantially in a horizontal position on a bench, a pair of normally disposed spindles supported on said bench in horizontally spaced relation to said rod, said spindles being normally in contacting relation, a transfer spindle disposed on said bench intermediate said rod and said pair of spindles for transferring a predetermined number of rubber bands from said rod to said spindles, means supported by said bench for separating said pair of spindles for expanding said plurality of rubber bands into elongated flat form, said card being inserted into said predetermined number of rubber bands when in their expanded condition, and means for automatically returning said spindles to normal contacting relation for re-

moval of the bands with the card therein from said spindles.

2. The structure according to claim 1, wherein said first means comprises a hopper for supporting a mass of rubber bands in jumbled position, a vertically disposed pipe in said hopper comprising a vertical body portion having a gooseneck at the upper end thereof which opens downwardly in the hopper, an air blower in communication with the lower end of said pipe, said elongated rod being movably supported in said hopper in axial relation to said gooseneck, and a door in said hopper opposite said rod.

3. The structure according to claim 1, wherein said second means comprises a bracket at one end of said bench, and a screw in said bracket for releasably retaining said rod in horizontal position on said bench.

4. The structure according to claim 1, wherein said spindles comprise a lower one and an upper one free of said bands fixed to said bench, a rod extending through said lower spindle and being fixed to an upper spindle, a spring surrounding said rod and being disposed between a collar thereon and said bench for normally holding said spindles in contact, and a treadmill connected with said rod for moving said upper spindle away from said lower spindle.

5. The structure according to claim 1, wherein said transfer spindle is pivotally supported on a vertical axis for selective movement toward said rod or said spindles.

6. The structure according to claim 5, wherein said transfer spindle is supported on the beam of a weighing scale.

7. An apparatus for depositing flexible annular articles on an elongated member comprising in combination, an enclosure for receiving a mass of loose flexible annular articles, a member supported in the enclosure and upon which the annular articles are to be deposited, a source of air under pressure communicating with said enclosure, means adjacent the source of air and the mass of loose flexible articles and extending to a point adjacent one end of said elongated member, whereby the flexible annular articles are carried by pressurized air and are guided through said means and are discharged onto said elongated member.

8. An apparatus of the character described comprising in combination, a hopper for receiving a mass of rubber bands in a loosely jumbled condition in the bottom thereof, a rubber band receiving rod mounted vertically in the hopper, a vertically disposed pipe arranged in the hopper and being open at both of its ends, the upper end of the pipe being substantially in a downwardly extending gooseneck portion, the discharge end of which is disposed directly over the upper end of the rod, an air blower in communication with the bottom of the pipe and the rubber bands in said hopper, whereby air from the blower forces the loose rubber bands upwardly through the pipe and discharges the same through said gooseneck upper end of the pipe onto said rubber band receiving rod.

9. An apparatus of the character described in claim 8, wherein the rubber band receiving rod is removably supported in the hopper.

10. An apparatus of the character described in claim 8, wherein a door is mounted in the hopper to permit said rod to be removed therefrom after it has been filled with rubber bands.

11. An apparatus of the character described comprising in combination, a vertical casing formed with a hopper portion in the lower end thereof, a first receipt of rubber bands in a loosely jumbled condition, a rubber band receiving member supported vertically in the casing, a vertically disposed tubular member open at its upper and lower ends and supported within the casing, the open lower end of the tubular member extending into the hopper portion and being spaced from the bottom thereof, the upper end of the tubular member being provided with a gooseneck discharge portion positioned directly over the
upper end of the rubber band receiving member, and
means for delivering the loose rubber bands from the
hopper upwardly through the tubular member for dis-
charge through said gooseneck portion onto said rubber
band receiving member.

12. An apparatus of the character described in claim
11, wherein in the means for delivering the loose rubber
bands from the hopper into the tubular member comprises
a blower projecting upwardly through the hopper with its
discharge end extending into the open lower end of the
tubular member.