March 28, 1961 M. CURRY 2,977,006

AGITATOR-HOPPER ASSEMBLY FOR SPOOL LABELERS, MACHINES OR THE LIKE

Filed Jan. 28, 1959 4 Sheets-Sheet 1

FIG. 1

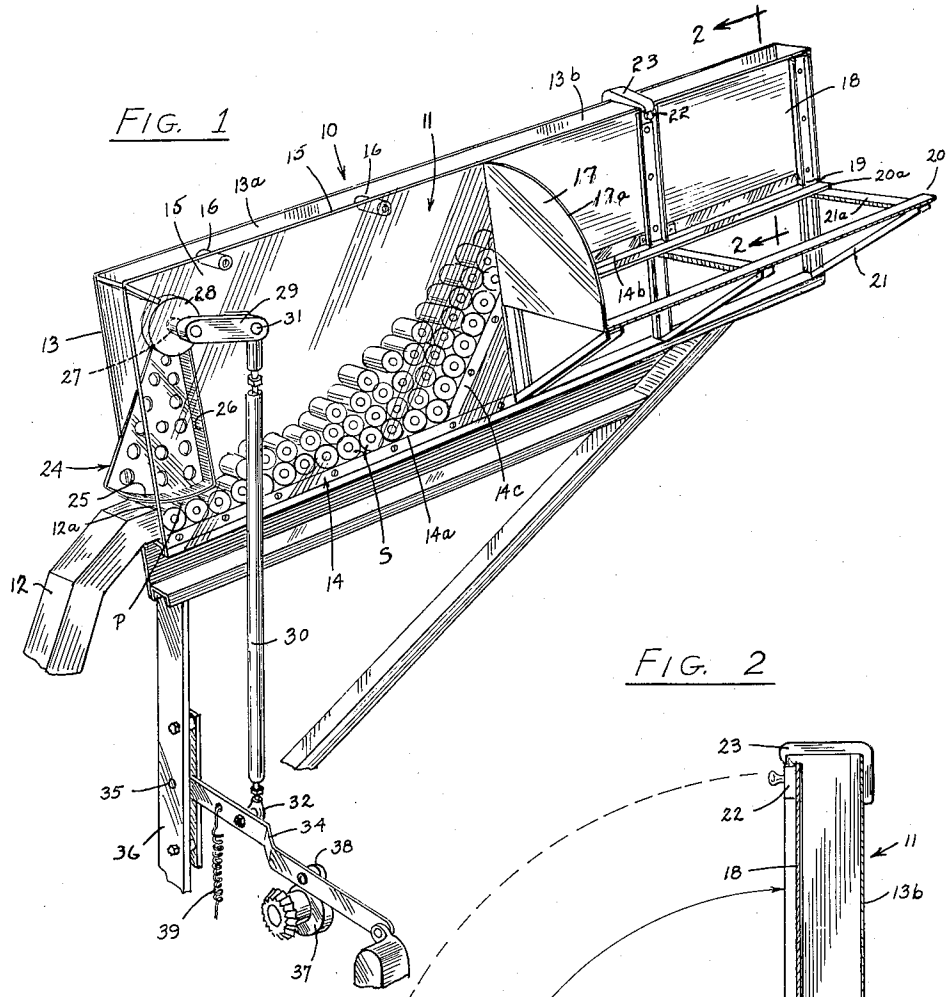
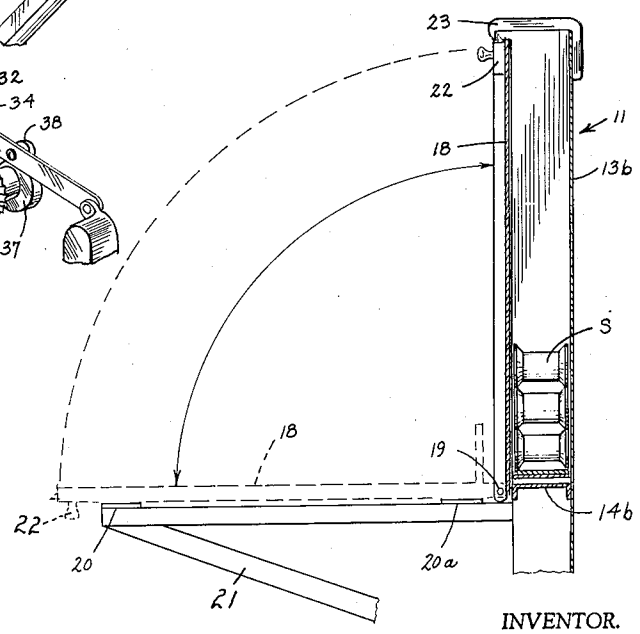


FIG. 2



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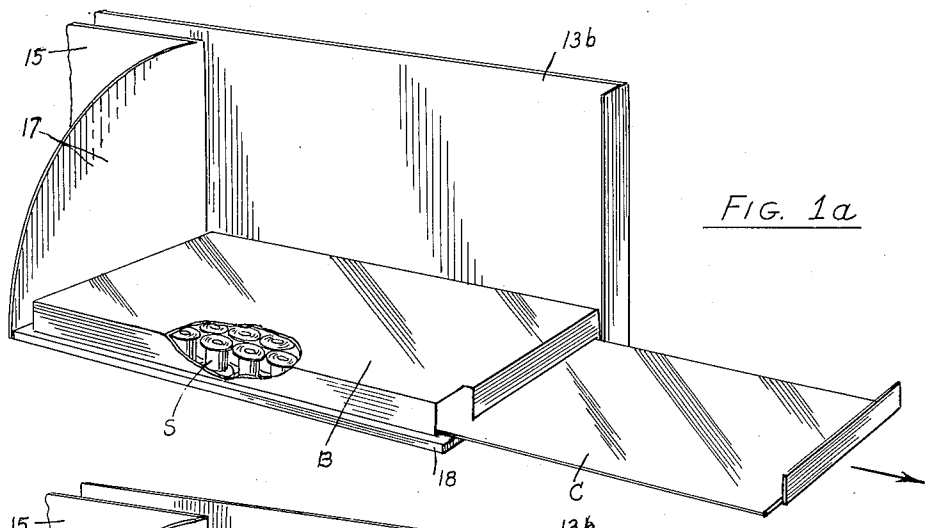

FIG. 1a

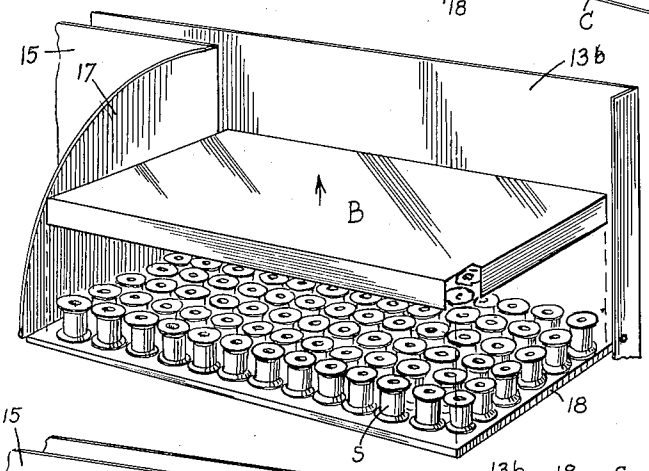

FIG. 1b

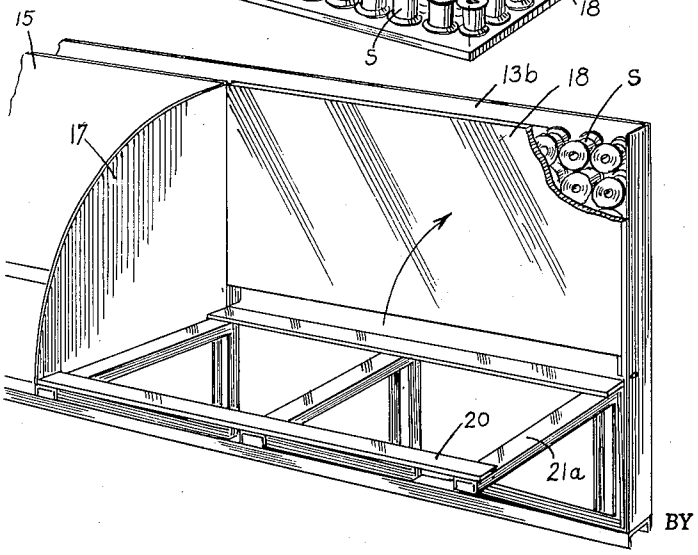

FIG. 1c

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FIG. 3

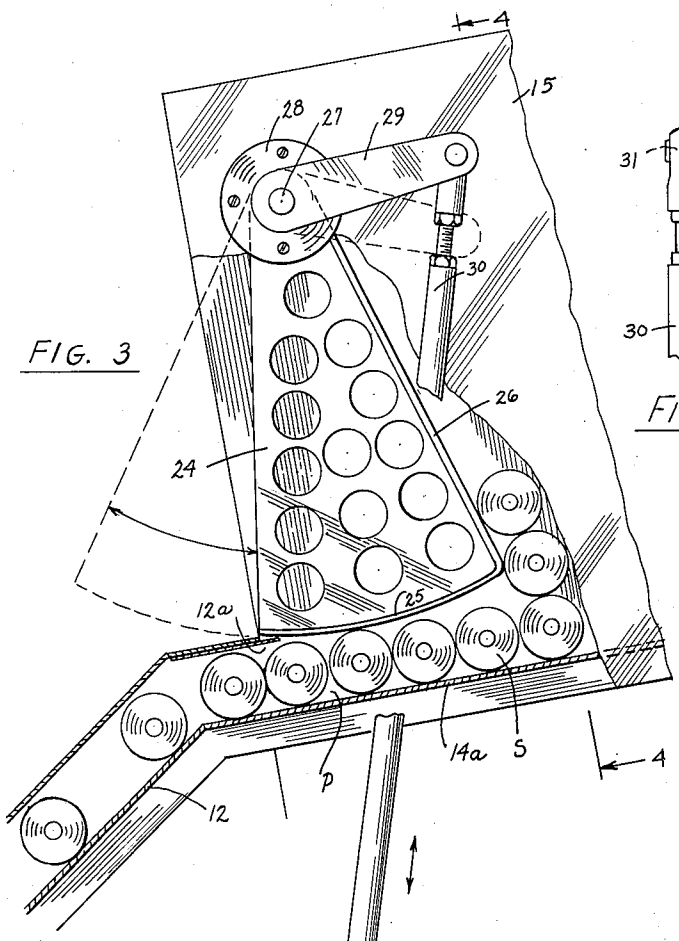

FIG. 4

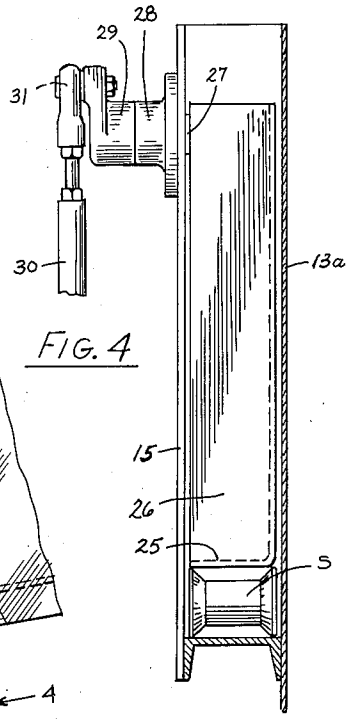

FIG. 5

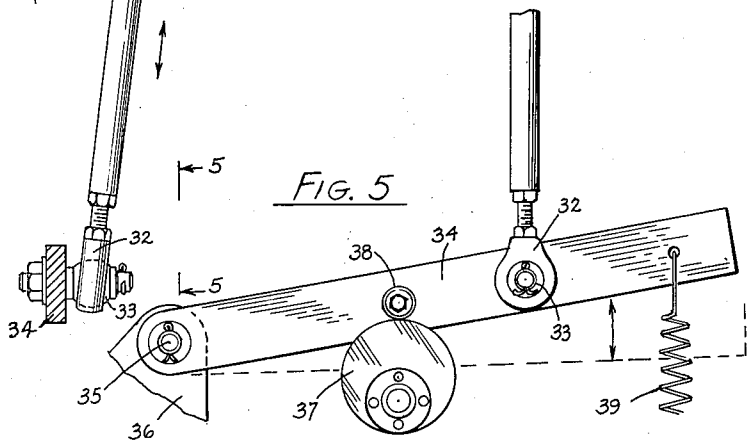

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FIG. 6

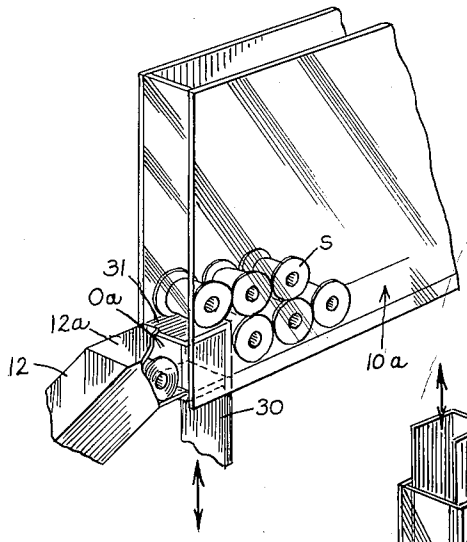


FIG. 7

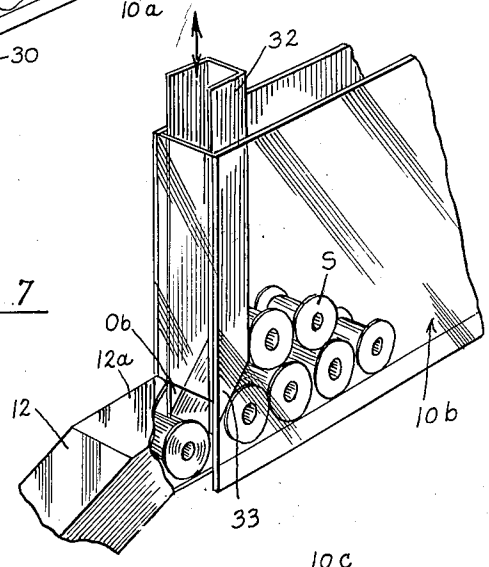
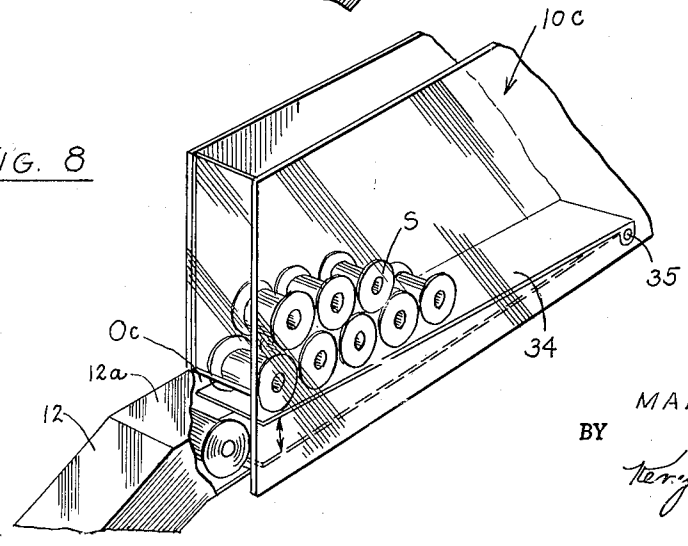


FIG. 8



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United States Patent Office 2,977,006 Patented Mar. 28, 1961

2,977,006

AGITATOR-HOPPER ASSEMBLY FOR SPOOL LABELERS, MACHINES OR THE LIKE

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Filed Jan. 28, 1959, Ser. No. 789,594

5 Claims. (Cl. 214—301)

This invention relates to machines used to label or ticket thread spools and especially to an arrangement for feeding these spools into the machine with continuous and even flow.

In thread spool labeling or ticketing machines, in which labels are applied to ends of spools, it is important that the spools be fed uniformly and continuously to the machine so that proper labeling or ticketing of successive spools may be carried out.

Principal objects and features of the invention are the provision of novel agitator-hopper assembly means into which large groups of spools collected in boxes after completion of thread winding or other earlier operations thereon are introduced and intended then to be fed therefrom by gravity through a spool runway to the ticketing or labeling, or similar machine, the agitation of the spools in the assembly serving to insure continuity and uniformity of feed thereof.

Other objects and features of this invention, therefore, are the provisions of means to insure a continuous and uniform flow of spools into the labeling or ticketing, or similar machine.

Further objects and features of the invention are the provision of simple mechanism for effecting the foregoing objects.

Additional objects and features of the invention will become apparent from the following specification and the accompanying drawings forming a part thereof wherein:

Fig. 1 is a partially broken away perspective view of the agitator-hopper assembly of this invention;

Figs. 1*a*, 1*b* and 1*c* are fragmentary perspective views of successive steps in the introduction of groups of spools from individual boxes into the agitator-hopper assembly;

Fig. 2 is a section taken along the plane of line 2—2 of Fig. 1;

Fig. 3 is a fragmentary side elevation of the agitator-hopper assembly;

Fig. 4 is a view taken along the plane of line 4—4 of Fig. 3;

Fig. 5 is a view taken along the plane of line 5—5 of Fig. 3; and

Figs. 6, 7 and 8, respectively, are fragmentary perspective views of three other modified agitator arrangements for the assembly of this invention.

Referring to the drawing and first to Figs. 1 and 2, the reference character 10 denotes generally the agitator-hopper assembly. This assembly includes a hopper 11, mounted in juxtaposition with the receiving end or entrance 12*a* of a spool feed runway or chute 12 which is designed to deliver the spools to the ticketing or labeling machine (not shown).

The hopper 11 includes a continuous elongated back panel 13 having generally rectilinear shape with its longer axis inclined to the horizontal. A floor 14 extends forwardly of the back panel 13. This floor has two parallel portions 14*a* and 14*b* respectively forming bottoms for the forward and rearward sections 13*a* and 13*b* of the panel 13, said parallel portions being joined by an inclined portion 14*c*.

A front panel 15 preferably of transparent material such as "Plexiglas" or other nonshatterable synthetic plastic is mounted parallelly with the back panel portion 13*a* being spaced therefrom by suitable spacers 16, a distance slightly in excess of the length of the spools S which are to be fed from the hopper 11 to a ticketing or similar machine via runway 12. The spacing permits free rolling movement of the spools S but prevents their being turned end over end between back and front panels 13 and 15. A laterally extending wall 17 projects forwardly of and at right angles to the front panel 15; this wall has an arcuately curved front edge 17*a*, or may have any other desired shape.

Referring now to Fig. 3 and Fig. 4, the entrance or mouth 12*a* of runway 12 is applied adjacent the leading end of floor 14*a* so that spools S may roll successively directly from floor 14*a* into the runway.

Referring now to Figs. 1 and 2, a panel 18 is secured hingedly at 19 adjacent floor portion 14*b* so that it may be swung as a door panel from its vertical position shown in full line, substantially 90° to the position shown in dotted line in Fig. 2 at which time it serves as a receiving platform that rests on front and rear support bars 20 and 20*a* carried by brackets 21 and 21*a* extending from the rear panel 13 below floor portion 14*b*. A spring latch 22 of conventional kind secured to the door panel 18 serves with catch bar 23 secured to panel portion 13*b* to temporarily retain the door panel 18 in its vertical position at which time it lies parallel with and in front of the said rear panel portion 13*b* being spaced therefrom a distance sufficient to permit rolling movement of spools S without end to end turning of the spools.

In practice, a container or box B (see Fig. 1*a*) preferably of light gauge metal is filled with wound spools S at a spool winding machine (not shown). This box has a slidable removable cover C and contains a single layer of the up-ended spools. This box is placed (see Fig. 1*a*) on door panel 18 when the latter is in its down position, as seen in Fig. 2, and resting as a platform on support bar 20 with the cover side of the box down. The cover C of the box B is then slid out or otherwise removed. The box B is then lifted off the spools (Fig. 1*b*) and the door panel 18 is then swung upwardly to the position shown in Fig. 1*c*, and in full line in Fig. 2, and held in this position by latch 22. The spools S now lie in the space between door 18 and back panel position 13*b*. They then may roll freely and rapidly via steeply inclined floor portion 14*c* into the hopper space above floor 14*a* without turning end to end, and then tend to move on floor 14*a* toward the entrance or open mouth 12*a* of runway 12.

To insure against the spools arching or jamming at 12*a*, agitation of the spools S in the said hopper space is provided for example in a first embodiment by an agitator 24. This agitator 24, as first shown in Figs. 1 and 3, has segmental shape with an arcuate laterally extending edge wall 25 and a radially directed laterally extending wall 26. Both walls substantially span the space between the front and rear panels 15 and 13. The agitator 24 is secured to a shaft 27 which in turn is mounted in a bearing 28 secured to front panel portion 15 so that the axis of shaft 27 coincides with the center of generation of the arcuate edge wall 25. A crank 29 is secured to shaft 27 forwardly of panel 15. A link 30 is pivotally connected at 31 to the crank 29 and through a universal joint ball socket 32 to a ball pin 33 extending from an oscillatable lever 34. This lever is pivoted at 35 to a fixed frame part 36. A driven eccentric or cam 37 engages a cam follower roller 38 carried by lever 34. A biasing means 39 maintains engagement between the follower roller 38 and cam 37. Driven rotation of the

cam 37 in any desired manner thus oscillates lever 34 and causes corresponding oscillation of the spools S in the hopper 11 by the agitator 24. Any other suitable conventional means for oscillating the agitator 24 may be utilized. Likewise any suitable agitation means to prevent bridging or arching of the spools to jam the latter and interfere with their free flow may be used. Alternative agitation means is hereinafter described.

As shown in Fig. 3, the walls 26 and 25 of the agitator 24 during its oscillation serve to give agitational motion to the spools S so that they will not arch over or jam but, instead, tend to gravitate toward the mouth 12*a* of the runway. The radius of agitator 24, however, is such that the arcuate wall 25 during its agitation always has a portion lying close enough to bottom 14*a* to define with it an exit passageway P through which only a single layer of spools S may pass from the hopper into the entrance or open mouth 12*a* of the runway 12. The swinging action of agitator 24 continuously directs or arranges spools in the hopper space to move into this single layer passageway P as illustrated in Figs. 1 and 3 so that continuity of orderly feed of spools to runway 12 is maintained.

A modified agitator arrangement intended as a substitute for the agitator 24 is illustrated in Fig. 6. In that figure the mouth 12*a* of runway 12 communicates via opening O*a* in the end wall of hopper 10*a*. This opening O*a* is dimensioned to pass one spool S at a time to said mouth 12*a*. A reciprocable member 30 having a lateral floor part 31 is mounted through the floor portion 14*a* adjacent said opening. Reciprocation of the member 30 by hand or mechanically in any suitable way across the opening O*a* causes its floor part 31 to agitate the spools so that they will not arch over or jam and will move out one by one through the opening O*a* into runway 12.

A further modified agitator arrangement is illustrated in Fig. 7. In this figure the mouth O*b* of the hopper 10*b* which opens into mouth 12*a* of runway 12 is also dimensioned to permit passage of one spool S at a time. A reciprocable member 32 having a tapered end 33 is mounted at the end wall of hopper 10*b* so that its tapered end will periodically close off opening O*b*. Manual or mechanical reciprocation in any suitable way of member 32 will permit periodic passage in single file of spools S through opening O*b* into runway 12. This reciprocation will also agitate the spools and prevent arch over and jam.

Still another modification is shown in Fig. 8. In this figure the floor portion 34 of the hopper 10*c* is supported suitably for oscillation about a fixed pivot 35 so that its end may be moved across the opening O*c* of the hopper to periodically allow passage of a single spool at a time via said opening into the runway 12. The floor portion 24 may be oscillated manually or mechanically in any suitable way, and will thereby agitate the spools, thus preventing arching and a jam at opening O*c*.

Although specific embodiments have been presented herein, variations in structural detail within the scope of the appended claims are possible and are contemplated. There is no intention, therefore, of limitation to the exact details shown and described.

What is claimed is:

1. A hopper assembly of the character described for effecting orderly delivery of rollable articles to a runway entrance, comprising a hopper having an unbroken rear wall, a parallelly disposed front wall coextensive with a portion of the rear wall, a sloping floor at the bottom of said two walls, an end opening between said walls adjacent the leading end of said floor and communicating with said entrance and whose dimensions permit successive individual passage of articles therethrough, a second sloping floor at an elevated position relative to the first-named sloping floor, a steeply sloping floor joining the said first-named and said second-named floors, a platform for the hopper mounted to swing pivotally about an axis adjacent said second-named floor from a first position parallel with said rear wall to a second position substantially at right angles to said rear wall and onto which in the second of its pivotal positions a rollable article carrying container may be temporarily placed for unloading of its rollable articles thereon and then removed, said platform then being movable to its first pivotal position to introduce the articles loaded thereon onto the second floor of said hopper whence they may roll rapidly and directly down said steeply sloping floor onto said first-named floor toward said end opening, means for preventing arching over of said articles within said hopper adjacent said end opening and their jamming thereof, agitator means in said hopper, means for oscillating said agitator means, and means including an arcuate wall on said agitator means movable therewith in proximity to the entrance to define a passageway leading to said entrance dimensioned to limit transit therethrough of articles from the hopper as a single layer.

2. A hopper assembly as per claim 1 in which said agitator means has segmental shape and includes an additional wall also movable with said agitator to engage and agitate said articles during such movement.

3. A hopper assembly as per claim 1 in which said agitator means has segmental shape and includes an additional wall extending laterally from an edge contiguous with said arcuate edge and also movable with said agitator means to engage and agitate said articles during such movement.

4. An agitator-hopper assembly for effecting orderly uninterrupted delivery of articles to a runway entrance comprising a hopper having forward and rearward sections, a rear wall, a parallelly disposed front wall coextensive in the forward section with a portion of the rear wall, a sloping floor in the forward section at the bottom of said two walls and an end opening in said forward section between said walls adjacent the leading end of said floor and communicating with said entrance and whose dimensions permit successive individual passage of articles therethrough, a second sloping floor at an elevated position relative to said first-named floor in the forward section, a steeply sloping floor between the two sections joining the said two first-named floors, a wall projecting laterally from said front wall at its rearward end, a platform in the rearward section pivotally supported adjacent said second-named floor and pivotable into a first position in parallelism with said rear wall and into a second position substantially at right angles to said rear wall and onto which in the second pivotal position a rollable article carrying container provided with a slidably removable cover may be temporarily deposited for unloading of its rollable article content thereon by removal of said cover and thereafter on removal of said container leaving the articles on said platform, said platform then being swingable to its first pivotal position to introduce the rollable articles loaded thereon into the rearward section and onto the second-named floor of the hopper whence they may roll freely and rapidly down the steeply inclined floor onto said first-named floor into said forward section and toward said end opening and into said entrance and means within said forward section for agitating said rollable articles to prevent their arching adjacent said end opening.

5. A hopper assembly of the character described for effecting orderly delivery of rollable articles to a runway entrance, comprising a hopper having forward and rearward sections, an unbroken rear wall, a parallelly disposed front wall coextensive in the forward section with a portion of the rear wall, a sloping floor in the forward section at the bottom of said two walls, an end opening in said forward section between said walls adjacent the leading end of said floor and communicating with said entrance and whose dimensions permit successive indi-

vidual passage of articles therethrough, a second sloping floor in the rearward section at an elevated position relative to the first-named sloping floor, a steeply sloping floor between the two sections joining the said first-named floor and said second-named floor, a wall projecting laterally of said front wall at its rearward end, a platform for the hopper in the rearward section mounted to swing pivotally about an axis adjacent said second-named floor from a first position parallel with said rear wall to a second position substantially at right angles to said rear wall and onto which in the second of its pivotal positions a rollable article carrying container provided with a slidably removable cover may be temporarily placed for unloading of its rollable articles thereon by removal of said cover and then removal of said container leaving said articles on said platform, said platform then being removable to its first pivotal position to introduce the

articles so loaded thereon onto the second floor in the rearward section of said hopper whence they may roll rapidly and directly down said steeply sloping floor onto said first-named floor in the forward section of said hopper toward said end opening, and means for preventing arching over of said articles within the forward section of said hopper adjacent said end opening and their jamming thereof.

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