United States Patent

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[15] **3,682,292**

[45] **Aug. 8, 1972**

[54] POWERED LID ORIENTOR

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[52] **U.S. Cl.** ..... **198/33 AD**
[51] **Int. Cl.** **B65g 47/24**
[58] **Field of Search** ..... 198/33 AA, 33 AD; 193/43 R

[56] **References Cited**

UNITED STATES PATENTS

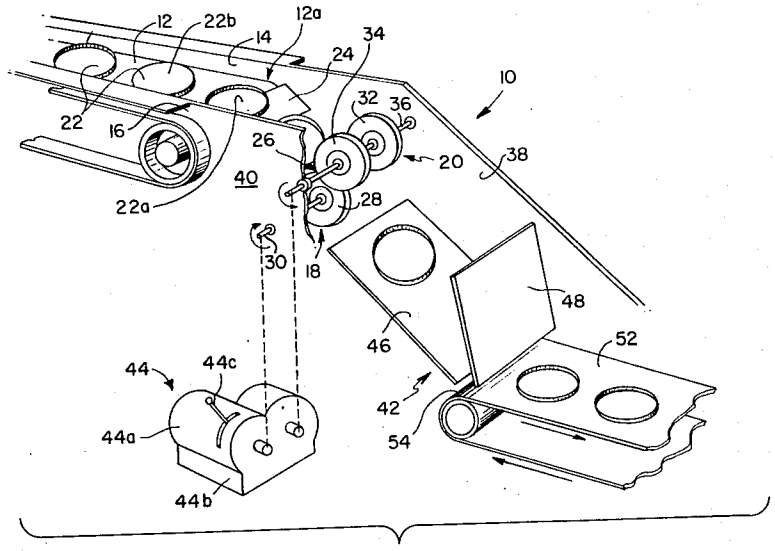
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[57] **ABSTRACT**

A machine for orienting skirted lids has a pair of counter-rotating brush elements arranged to draw a lid into the nip between them and to expel the lid to a discharge location. One brush element engages the lid along a generally central diametrical portion thereof and the other brush element engages the lid at two side portions, i.e. along chords parallel to the diameter, spaced on either side of the central portion. The different engagements of the brush elements with a lid oriented with the skirt facing upward, and with a lid in a skirt-down orientation, enable the brush elements to discharge the differently-oriented lids with different rotational velocities such that all the lids end up with the same orientation on the discharge location.

12 Claims, 6 Drawing Figures



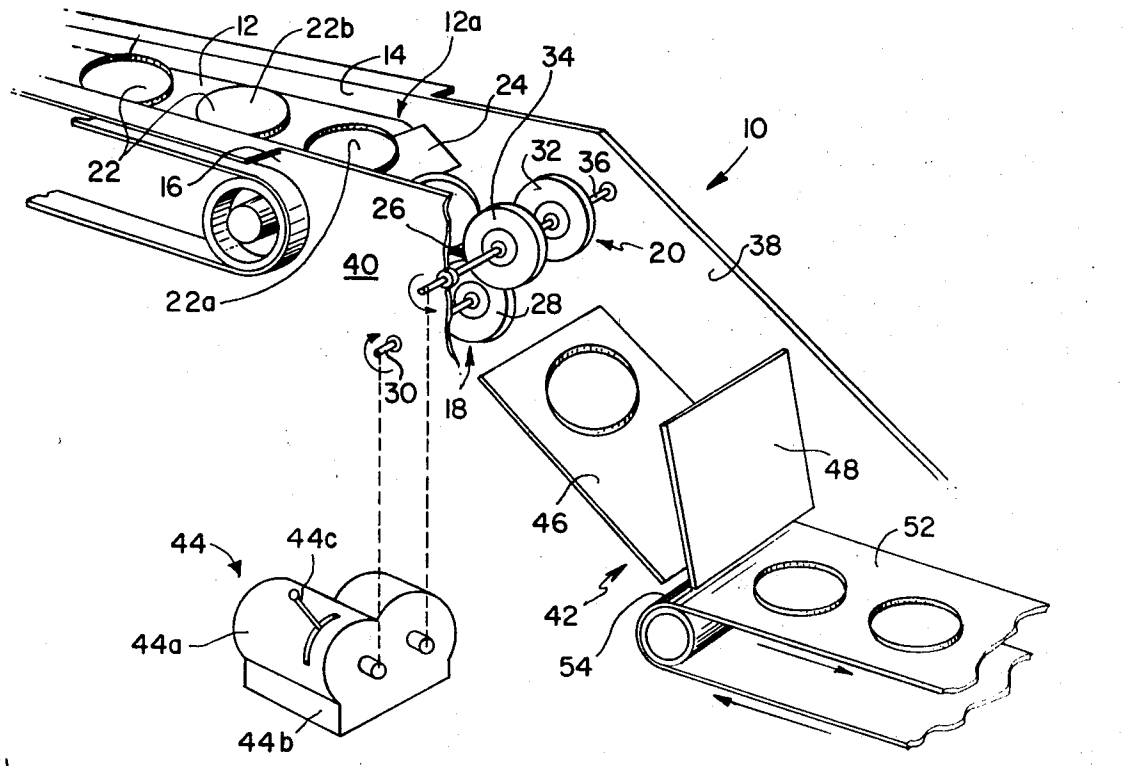


FIG. 1

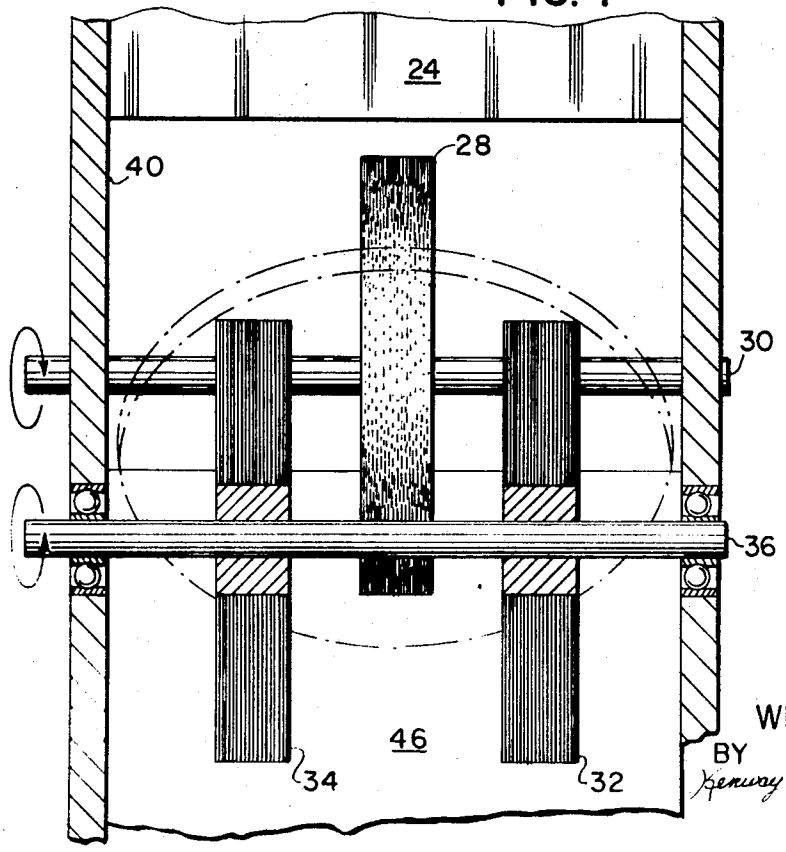


FIG. 2

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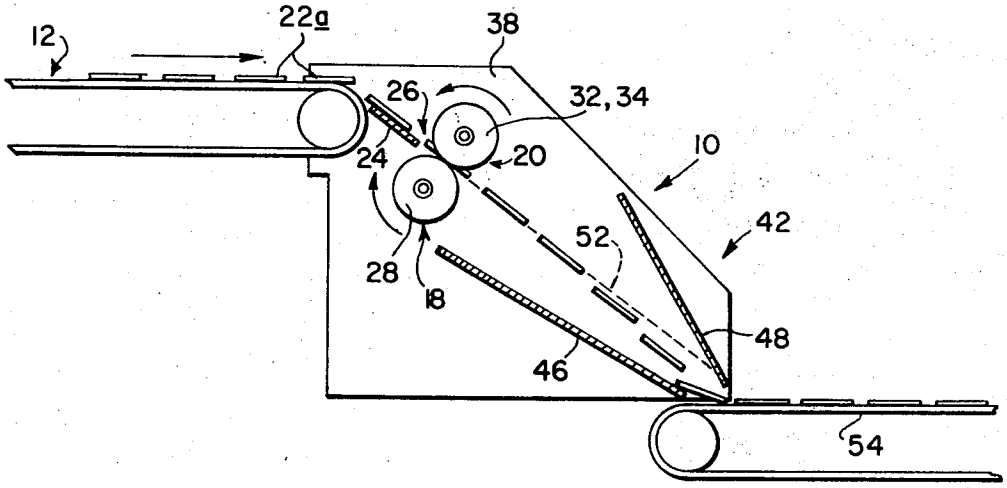


FIG. 3

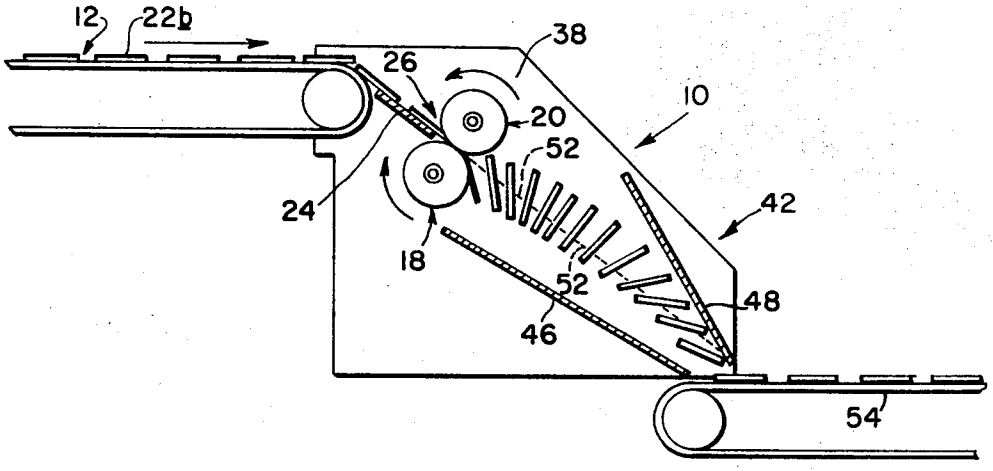


FIG. 4

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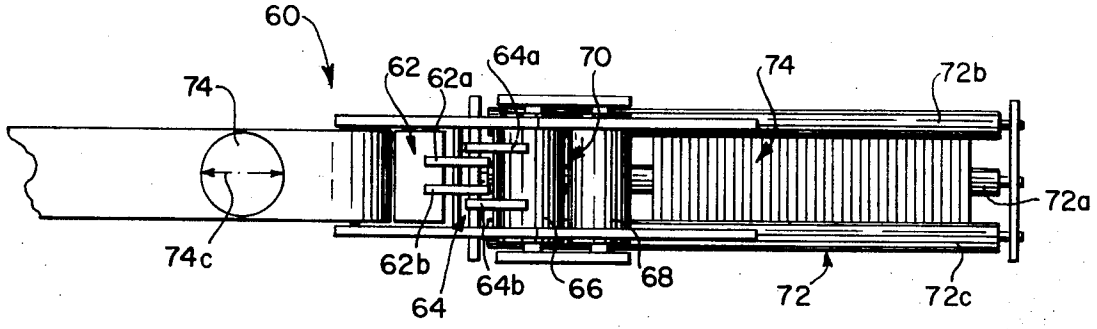


FIG. 5

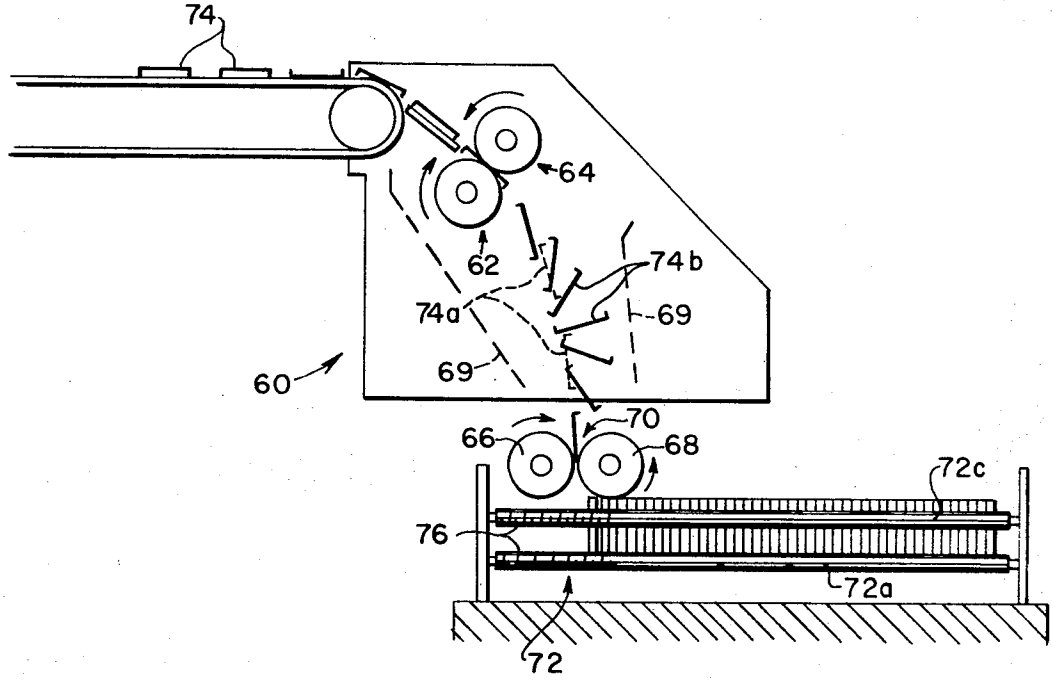


FIG. 6

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POWERED LID ORIENTOR

BACKGROUND OF INVENTION

This invention relates to a machine for inverting lids having skirts, and like skirted disk-shaped articles, having one orientation, and for passing the articles of opposite orientation without inversion, so that all the articles end up with the same orientation.

Plastic snap-on lids and other articles of like shape often need to be placed in a uniform orientation, as in the manufacturer's process of packaging them. For example, apparatus which molds plastic snap-on lids often discharges newly-formed lids onto a platform with some lids oriented face up, with their skirts extending downward, and others oriented face down so their skirts extend upward. However, the lids need to be placed in a uniform orientation for stacking them or for other further processing.

Automatic orientors have heretofore been provided for cookies and crackers, such as ginger snaps, and also for container covers. For example, U.S. Pat. No. 3,311,218 discloses a gravity-aided machine for converting an incoming stream of face-up and face-down lids into an outgoing stream with all the lids having the same orientation. These prior machines, however, have limited reliability in that they sometimes fail to invert all the improperly-oriented articles. This often occurs with increasing frequency when the machines are operated at increasing speeds, i.e., the articles are fed to the orientors at rapid rates.

Accordingly, it is an object of this invention to provide an automatic lid orientor that provides reliable operation, even when processing lids at comparatively rapid rates.

Another object of the invention is to provide a lid and like article-orienting mechanism that positively engages the articles.

A further object of the invention is to provide a lid and like article-orienting mechanism that operates with no requisite dependence on gravity. Such an orientor can receive lids from a vertical direction as well as horizontally, and likewise can discharge them to an output chute having either a vertical or a horizontal orientation.

It is also an object of the invention to provide an orientor of the above character which can be constructed at relatively low cost and, further, which can be adjusted readily for operation with different articles.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

GENERAL DESCRIPTION

An orientor embodying the invention processes skirted snap-on lids, and like disk-like articles having a circular periphery and a protrusion from one face along a path adjacent the periphery. The orientor feeds the lids one at a time into the nip between a pair of counter-rotating brush elements so that the two brush elements engage opposite faces of the lid. One brush element engages the lid along a central portion, and the other brush element engages it at two side portions, i.e., along chords parallel to the diameter, spaced on either side of the central portion. This latter brush element does not engage the lid at its central portion. The brush elements, which rotate in opposite directions, draw a lid from an upstream direction into the nip between them and expel it in the downstream direction. Downstream from the brush elements at a discharge location is apparatus such as a slide or conveyor which receives the discharged lids and carries them to further processing or handling equipment.

With this arrangement, the brush elements expel each lid to the discharge location with one of two rotational velocities, depending on the face-up or face-down orientation with which each lid enters the brush elements, such that all the lids assume the same orientation at the discharge location. This differential operation results from the different engagements of the two brush elements with the trailing edge of a lid, i.e., with the edge of the lid last to leave the brush elements as they discharge the lid.

The invention accordingly comprises the features of construction, combination of elements, and arrangement of parts exemplified in the constructions hereinafter set forth, and the several steps and the relation of one or more of such steps with respect to each of the others effected by such apparatus, all as exemplified in the following detailed disclosure, and the scope of the invention is indicated in the claims.

BRIEF DESCRIPTION OF DRAWINGS

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in connection with the accompanying drawings in which:

FIG. **1** is a perspective view, partly broken away, of a lid orientor embodying the invention;

FIG. **2** is a top, horizontal, plan view of a fragmentary portion of the orientor of FIG. **1**;

FIGS. **3** and **4** are side views, partly broken away, of the orientor of FIG. **1** showing operation with differently-oriented lids;

FIG. **5** is a top plan view of a fragmentary portion of an alternate construction for an orientor in accordance with the invention; and

FIG. **6** is a side view, partly broken away, of the orientor of FIG. **5**.

DESCRIPTION OF ILLUSTRATED EMBODIMENTS

With reference to FIG. **1**, a lid orientor **10** according to the invention has a feed conveyer **12** fitted with side guides **14** and **16** and which delivers to a pair of brush elements **18** and **20** a single-file stream of lids **22**, **22** lying flat with either a face-up or a face-down orientation. The illustrated lids are snap-on plastic lids and hence each has a disk-shaped panel with a clamping skirt protruding from one face of the panel along the disk periphery. This configuration of the skirt gives the lid a protrusion on one side only and along a path adjacent the lid periphery. The other side of the lid is flat, at least along the outer annular portion adjacent the periphery. A face-up lid **22***a* has the skirt directed upward and a face-down lid **22***b* has the skirt protruding downward. At its output end **12***a*, the feed conveyor **12** discharges the lids, with the same orientation as on the conveyor, to a downwardly inclined ramp or slide **24**. The slide feeds the lids **22**, one at a time, to the nip **26** between the brush elements **18** and **20**. The lower brush element **18** has a single wheel-like rotary brush **28** mounted on a shaft **30** for rotation therewith; the

shaft **30** is parallel to the plane of the slide and transverse to the feed direction of the conveyor **12**. The upper brush element **20** has a pair of wheel-like rotary brushes **32** and **34** mounted for common rotation with a shaft **36** parallel to shaft **30**.

The shafts **30** and **36** are rotatably mounted to a pair of side plates **38** and **40** that are speced apart similar to the feed conveyor side guides **14** and **16** to ensure that the lids remain in line as they pass from the feed conveyor to an output chute, indicated generally at **42**. The illustrated shafts extend outside beyond the side plate **40** for engagement in a conventional manner with a drive unit indicated generally at **44**. The drive unit, which illustratively includes a motor and a transmission unit, drives the shaft **30** of the lower brush element clockwise and drives the shaft **36** of the upper brush element in the counter-clockwise direction. Further, the drive unit rotates the shaft of the single-brush element **18** more rapidly than it does the shaft of the other element **20**, the speed ratio is typically in the order of one and a half to one and preferably can be adjusted, illustratively by operation of a lever **44***c* on the drive unit. The speed of the drive unit motor preferably is also adjustable.

As shown in FIGS. **1** and **2**, the brush **28** of the brush element **18** is secured to the shaft **30** centered between the side plates **38** and **40** to engage the center line of each lid, i.e., to engage the lid along the lid diameter which is aligned with the direction of lid advance. The brushes **32** and **34** of the brush element **20**, on the other hand, are secured to the shaft **36** offset to either side from the brush **28**. Thus each brush **32** and **34** of the element **20** engages each lid along a chord parallel to the lid diameter along which it is engaged by brush **28**. In particular, it is considered preferable to position the brushes **32** and **34** of the element **20** to engage each lid approximately one-third of the distance in from the edges of the lids which are adjacent the side plates **38** and **40**. Thus, as seen in the plane of FIG. **2**, each brush **32** and **34** is spaced to the side from the brush **28** by approximately one-sixth of the diameter of the lid.

With further reference to FIG. **1** and as also shown in FIGS. **3** and **4**, the illustrated output chute **42** includes a slide platform **46** and a deflector plate **48**. The platform and plate form a funnel-like guide chute that can receive lids expelled from between the brush elements and direct them onto an output station **50**; the illustrated output station is at the load end of a belt conveyor **54**. The platform **46** and plate **46** are thus in line with the feed conveyer **12** and with the brush elements **18** and **20**, and are oriented relative to each other in a funnel-like configuration having the narrow end at the orientor output station. The slide platform **46** is below the straight-line path **52** extending from the feed slide **24** and between the brush elements, and the deflector plate **48** is above this path.

With regard to the operation of the orientor **10**, consider first the passage of a face-up lid **22***a* through it as shown in FIG. **3**. As a lid **22***a* slides into the nip **26**, the brush elements **18** and **20** draw it into engagement between them. Each brush element tends to rotate the lid in the same direction as the brush rotates, but the other brush element resists this motion. Hence, the brush elements expel the lid to the discharge chute **42** with essentially only a lineal velocity, which carries the lid along a trajectory substantially coincident with the path **52**. Accordingly, the lid traverses the span to the output conveyor **54** without restriction other than whatever contact it has with the discharge chute, and arrives at the output conveyor **54** with the same face-up orientation it had on the feed conveyor **12**.

The lid typically lands on the slide platform **46** of the output chute and slides from there onto the output conveyer. However, if the lid is expelled with enough energy to strike the barrier plate **48**, it drops from there without inversion to the plate **46** or directly onto the conveyer **54**.

The two brush elements **18** and **20** are understood to provide this non-inverting transfer of a face-up lid to the output station with the following action. While the lid is fully between the two brush elements, each counteracts the action of the other to change the lid path or orientation. Further, as the trailing edge of the lid passes between the brush elements, the lid skirt becomes embedded in the dual brushes **32** and **34** of the upper brush element **20**. This engagement causes the brush element **20** to tend to impart a counter-clockwise rotational velocity to the lid, i.e., in the same rotational direction as the brush element **20**. However, the engagement of the brush **28** of the lower single-brush element **18** with the lid, which continues for an instant after the lid leaves the brush element **20** because the element **18** engages the center of the lid, resists and cancels this rotational "kick." However, this final engagement of the single brush **28** with the lid, for an instant after it passes beyond the dual brushes of element **20**, does not impart significant rotational velocity to the lid because the brush **28** is acting on a smooth, unskirted surface of the lid.

FIG. **4** illustrates the passage of a face-down lid **22b** through the orientor of FIG. **1**. The lid enters the nip between the brush elements **18** and **20** and is drawn forward between them in a manner similar to the passage of a face-up lid. However, the engagement of the single brush **28** of the lower-brush element **18** with the lid skirt is not fully countered by the dual brushes of the upper-brush element. Accordingly, the lower-brush element imparts a clockwise rotation to the lid as it is expelled from the brush elements. This rotational velocity summersaults the lid to a face-up orientation as it passes within the output chute to the output conveyer, so that it arrives at the output station **50** with the desired face-up orientation, as illustrated.

Thus, the brush element **20** appears to function principally to accelerate lids forward along the desired path; and the brush element **18** functions principally to impart, only to a lid oriented to project its skirt toward this element, a net rotational velocity that inverts the lid as it freely falls after ejection from the brush elements. The output chute **42**, and conveyor **54**, are arranged to catch the freely-moving lids and maintain them in a uniform orientation. The brush element **20** provides the basically lineal accelerating operation by virtue of its engagement with each lid along portions thereof symmetrically spaced to the side from the central diametrical portion, where it does not engage the lid, coupled with the simultaneous engagement of the other brush element with the lid. Similarly, the brush element **18** provides the inverting acceleration to lids of one orientation by virtue of its engagement with each lid only along the aforementioned central portion.

As indicated above, the drive unit **44** preferably rotates the single-brush element **18** at a rate faster than the rotation of the brush element **20**. This faster rotation of the brush element **18** has been found to increase the rotationaly velocity which the brush elements impart to a face-down lid and hence to enhance the lid-flipping action illustrated in FIG. **4**. The difference in brush element speeds preferably is in the order of one and a half to one. For example, one orientor constructed in accordance with the invention rotates the dual-brush element **20** at around 200 revolutions per minute and rotates the other, single-brush element **18** at a speed of about 300 revolutions per minute.

Further, by way of example, this orientor processes lids, each having a diameter of between 3 inches and 6 inches and a skirt height of around three-eighths inch, with each brush **28**, **32** and **34** having an outer diameter of 3 inches and a width (along its shaft) of between one-fourth and three-eighths inch. Further the two brush elements **18** and **20** are spaced apart, i.e., along a line between their shafts, by a distance just slightly greater than the radius of the brush element **18** plus the radius of the brush element **20**; thus, where the brushes of both brush elements have a three inch diameter, their shafts are spaced apart by 3 inches plus a clearance of 0.005 inch, which is less than the thickness of the lid panel.

It has further been found preferable where the brush elements are disposed one above the other as illustrated for receiving lids advancing along a horizontally-extending path, that the lower-brush element be the one having a single brush, as is illustrated in FIG. **1**. With this preferred relative orientation of the brush elements, it has been observed that the transit time of a lid between leaving the brush elements and arrival at the output station is essentially the same for both face-up and face-down lids, i.e., along the two lid trajectories shown in FIGS. **3** and **4**. That is, the orientor operates satisfactorily where the location of the brush elements is reversed from the arrangement shown in FIG. **1** so that the dual-brush element **20** is below the single-brush element **18**. However, with this alternative arrangement, lids that are inverted during passage from the brush elements to the output station have been observed to traverse this distance with a slightly longer time than lids that traverse the distance without inversion. Although the time differential is small and usually of no concern; as stated, the illustrated arrangement is considered preferable.

It should also be noted that the shafts **30** and **36** of the brush elements are spaced apart along a line transverse to the desired path **52** of lid advance into and out of the brush elements. Also, this line between the shafts is inclined from the vertical such that the path **52** is inclined downward as it extends from the brush elements to the chute **42**.

Although the illustrated lids **22** have flat panels from which the lid skirt protrudes, the invention can also be used with many lids in which the panels are recessed in one direction or the other at the central portion, provided the outer annular portion of the lid panel, i.e., adjacent the skirted periphery, is essentially flat.

FIGS. **5** and **6** show another construction for a lid orientor in accordance with the invention. In brief, the orientor, indicated generally at **60**, differs from the orientor **10** of FIGS. **1–4** in that instead of the two brush elements **18** and **20**, two wheel elements **62** and **64** are provided. Further, instead of one wheel element having a single wheel corresponding to the single brush **28** of brush element **18**, the wheel element **62** has two wheels **62***a* and **62***b*.

Also, the orientor **60** is illustrated as having a pair of guide rollers **66** and **68** at the discharge location **70** and guiding the oriented lids to a lid stacker **72**.

Thus, the orientor **60** receives lids **74** one at a time from an input belt conveyer, and the lids slide off the conveyor onto a ramp and thence into the nip between the wheel elements **62** and **64**. The wheel elements are driven to rotate in opposite directions in the same manner as discussed above with reference to the orientor **10**, and hence draw each lid to pass between them and then discharge the lid to the discharge location **70**. Guide plates **69**, shown in FIG. **6** with dashed lines, can be provided to form a chute-like guide extending between the wheel elements and location **70**. However, the guide plates are optional, particularly because in most instances few lids are so misdirected that they do not arrive at the discharge location automatically.

The wheel elements **62** and **64** discharge on initially face-up lid **74***a* to the location **70** without inversion, as indicated in FIG. **6** with the dashed line showing. A face-down lid **74***b*, however, is expelled from the wheel elements with a rotational velocity so that it turns over end-for-end by 180° in traversing to the discharge location, as shown in FIG. **6** with full lines.

The wheels **62***a*, **62***b*, **64***a* and **64***b* can be brushes such as the FIG. **1** brushes **28**, **32** and **34**. However, as illustrated, they can alternatively be wheels having resiliently soft rims made, for example, of soft elastomeric or sponge-like material.

The wheel element **62** functions essentially in the same manner as the single-brush element **18** of the orientor **10**. The wheels **62***a* and **62***b* of this element are mounted for driven rotation together about a common axis and are located to engage each lid along chords which are parallel to each other and equally spaced about the lid diameter **74***c* (FIG. **5**) which is aligned along the path of lid travel in the orientor. Thus the wheels **62***a* and **62***b* are considered to engage each lid about a generally-central, diametrically-extending portion, in the same general manner as the brush **28** of FIG. **1**. The orientor **60** can, of course, have only a single wheel instead of the two wheels shown and which extends for a width as much as the width of the two wheels **62***a* and **62***b* and the space between them.

The other wheel element **64**, which is similar to the brush element **20** of FIG. **1** and functions in the same manner, has the two wheels **64***a* and **64***b* thereof driven for rotation together about a common axis and located to engage each lid along chords which are parallel to each other and to the chords along which the wheels **62***a* and **62***b* engage the lid. Further, the wheels **64***a* and **64***b* are symmetrically spaced from the lid diameter **74***c* by a distance greater than the spacing of the wheels **62***a* and **62***b*. Thus, the wheels of element **62** engage each lid inboard relative to engagement of the wheels of element **64**. It will thus be apparent that the wheel element **64** does not engage the lids along the central portion of engagement by the wheel element **62**, but engages each lid only outboard from, and on each side of, this central portion.

The spacing of each wheel of element **64** outboard from, or beyond, the wheel element **62** is typically less than one-third of the radius of the lids being processed. By way of illustrative example, an orientor for lids with a diameter of around four to five inches has a spacing or gap between wheels **62***a* and **64***a*, and likewise between wheels **62***b* and **64***b*, of around one-quarter to one-half inch, which is equivalent to a spacing of between one-fourth and one-tenth of the lid radius.

With further reference to FIGS. **5** and **6**, the guide rollers **66** and **68**, which extend horizontally and parallel to each other and transverse to the path of lid travel through the orientor **60**, are counter-rotatably driven to draw lids which arrive at the discharge location **70** downward between them; and to deposit the lids on-edge on the lid stacker **72**. The lid stacker has three parallel and horizontally-extending roller bars **72***a*, **72***b* and **72***c* driven in a conventional manner to rotate in the same direction. The bars are in a trough-like equilateral triangle arrangement (when viewed from the ends of the bars) with the bar **72***a* below the bars **72***b* and **72***c*. The side bars **72***b* and **72***c* thus maintain the lids in a stack resting on the bar **72***a*. Further, each bar has a short threaded portion **76** along the length thereof when the lids arrive from the guide rollers. These threaded portions function in a lead-screw manner to advance each newly-arrived lid to the right in the drawings. This advancing movement removes each lid from the point of arrival on the stacker and urges it into the stack of lids already assembled. In this manner the illustrated stacker functions in part as a conveyor to remove each lid from the point where it arrives from the orientor, prior to arrival of the next lid.

It will thus be seen that the objects as set forth above, among those made apparent from the preceding description, are efficiently attained. Since certain changes may be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween. In particular, the term "wheel element" is used in the claims to cover "bristled" wheel elements as described in the orientor of FIGS. **1–4**, soft-rimmed wheel elements as described with reference to FIGS. **5** and **6**, and equivalents thereto.

Having described the invention, what is claimed as new and secured by Letters Patent is:

1. A machine for receiving a succession of skirted disk-shaped articles moving forward along a path and disposed in either a first initial face-up orientation or a second initial face-down orientation, and for placing all said articles in the same orientation, said machine comprising:

A. first and second brush elements

1. having outer surface of circular cross-section and mounted for rotation about parallel axes extending transverse to said path,
2. each of which is disposed on a different side of said path to engage with said outer surface one face of each said article during the engagement by said other element with the opposed face of the same article,
3. said first brush element engaging each article along only a central portion thereof aligned with said path, and
4. said second brush element engaging each article simultaneously along two side portions thereof aligned along said path and located on different sides of said central portion, and being devoid of engagement with each article between said two side portions thereof, and

B. drive means for rotating said brush elements in opposite directions to move the portion of each brush element disposed in said path forward therealong, so that the engagement of said brush elements with each article advances it forward along said path.

2. A machine as defined in claim **1** in which said drive means rotates said first brush element at a faster rate than said second brush element.

3. A machine as defined in claim **1** further comprising:

A. conveyer means disposed downstream along said path from said brush elements for moving articles forward along a direction longitudinal to said path, and

B. guide means disposed along said path for receiving articles advanced out of engagement with said brush elements and for delivering them to said conveyer means, said guide means having at least one orientation-guiding surface for engagement at least with articles having one of said initial orientations.

4. A machine as defined in claim **1** in which:

A. said brush elements rotate about axes spaced apart along a direction transverse to said path at the passage of said path into engagement with said brush elements, and

B. said brush elements accelerate each article forward along said path and expel it with one of two different angular velocities depending on said initial orientation thereof.

5. A machine as defined in claim **4** in which said path extends forward in a horizontal and vertically downward direction at said passage thereof into engagement with said brush elements.

6. Apparatus for placing in uniform orientation disk-like articles, each of which has a panel with at least a substantially flat outer annular portion, and has a peripheral skirt extending from said panel on one side thereof, said apparatus receiving said articles disposed in either a first initial orientation or a second initial orientation and discharging said articles with said uniform orientation forward along a path, said apparatus comprising:

A. guide means for receiving airborne articles and guiding them along said path,

B. rotation-producing drive means,

C. a first tubular wheel element

1. of circular circumferential periphery and rotatable about a first axis transverse to said path,
2. disposed on a first side of said path for engagement at said periphery thereof with said article panel simultaneously along two side portions thereof aligned along said path symmetrically on

different sides of a central portion of said article panel,

3. devoid of engagement with said article panel between said side portions thereof,

4. rotated by said drive means in a direction to move the surface thereof which engages said articles forward along said path,

D. a second tubular wheel element

1. of circular circumferential periphery and rotatable about a second axis parallel to said first axis,

2. disposed on a second side of said path opposite said first side for engagement at said periphery thereof with said article panel only along said central portion thereof aligned along said path and

3. rotated by said drive means in the direction opposite from said first wheel element and co-acting with said first wheel element to accelerate each article and expel it toward said guide means, said second element further imparting a first rotational velocity only to expelled lids having a first initial orientation that disposes said skirt thereof toward said second side of said path, so that articles having said first initial orientation arrive at said guide means inverted to said second orientation, and said articles having said second initial orientations arrive at said guide means with said second orientation.

7. Apparatus as defined in claim **6** in which said drive means rotates said second wheel element more rapidly than said first wheel element.

8. Apparatus as defined in claim **6** further comprising:

A. input conveyer means delivering said articles single-file to said first and second wheel elements along said path upstream from said wheel elements, and

B. output means for receiving articles from said guide means and advancing them longitudinal to said path downstream from said wheel elements.

9. Apparatus as defined in claim **6** in which said second wheel element engages said article panel simultaneously along two symmetrically spaced-apart subportions within said central portion thereof.

10. Apparatus as defined in claim **6** in which said first wheel element is free of engagement with said article panel along said central portion thereof.

11. A powered lid orientor for orienting skirted lids and lid-like articles comprising a pair of counter-rotating wheel elements having wheel surfaces of circular cross-section and being spaced to receive between them a lid to be oriented and to engage with said wheel surfaces opposite sides of a lid as it passes between them; one wheel element engaging said lid along a central diametrical portion thereof to engage the skirt of a first lid which is oriented to project the skirt toward said one element abruptly as said lid moves beyond and out of engagement with said wheel elements; and the other wheel element engaging said lid at two side portions thereon lying along chords shorter than the diameter and substantially symmetrically spaced about said central portion, to terminate engagement with said skirt of a second lid which is oriented to project the skirt toward said other element prior to the termination of engagement of said first element with said second lid.

12. Apparatus for placing in uniform orientation disk-like articles each of which has a panel and a peripheral skirt extending on one side thereof beyond said panel, said apparatus receiving said articles disposed in either a first initial orientation or an inverted second initial orientation and discharging said articles with said uniform orientation forward along a path, said apparatus comprising a pair of counter-rotating article-accelerating wheel elements spaced to receive between the wheel surfaces thereof an article having one of said initial orientations and to engage opposite sides thereof thereby to accelerate said article along said path as it passes between said elements; one wheel element engaging said article at two side portions thereon which extend along chords shorter than the article diameter and are substantially symmetrically spaced about the article diameter, and for accelerating said article substantially uniformly along said path independent of said article orientation; and the other said wheel element engaging said article at a central portion intermediate said side portions thereof and imparting a first rotational velocity to only an article passing between said wheel elements with an initial orientation which projects said skirt thereof toward that other wheel element.

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