

July 24, 1956

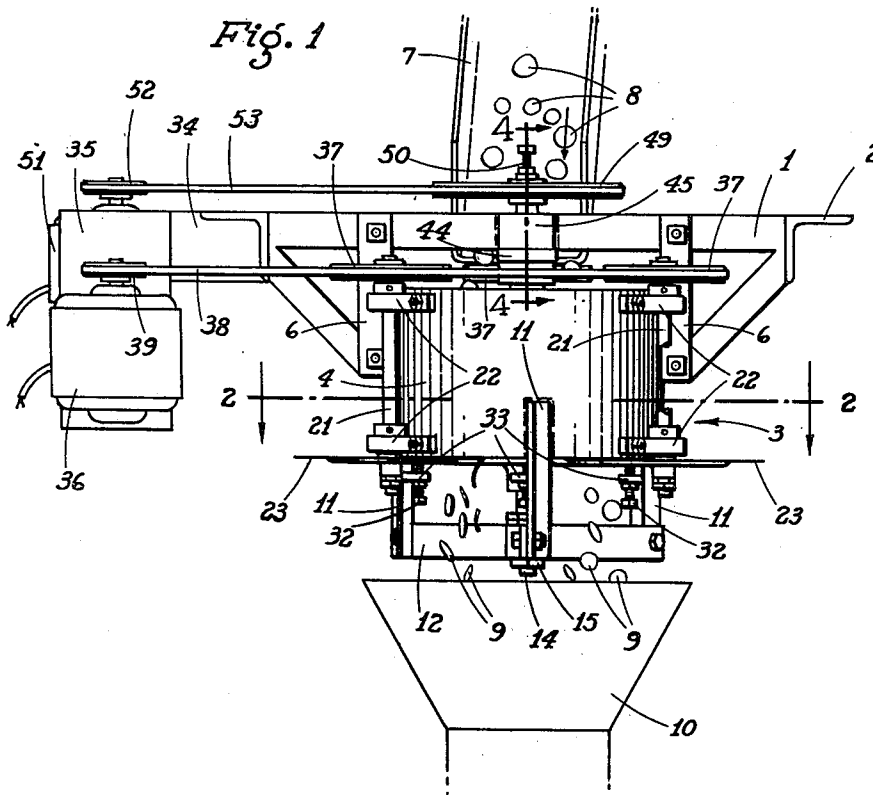
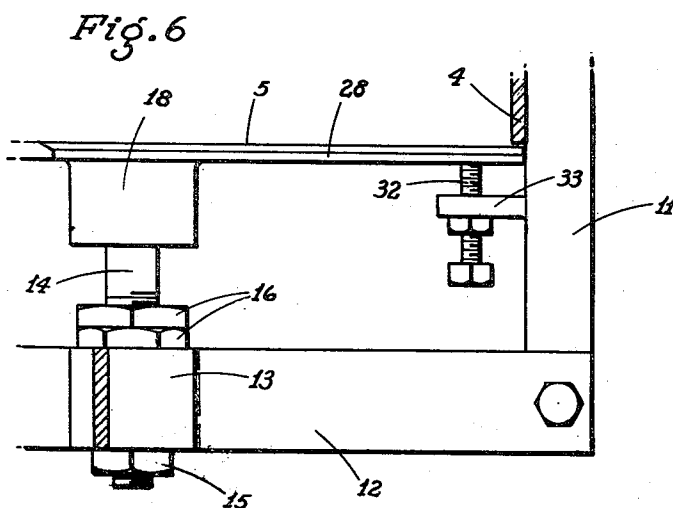
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VERTICAL AXIS DISC ONION SLICER

Filed Feb. 1, 1954

3 Sheets-Sheet 1



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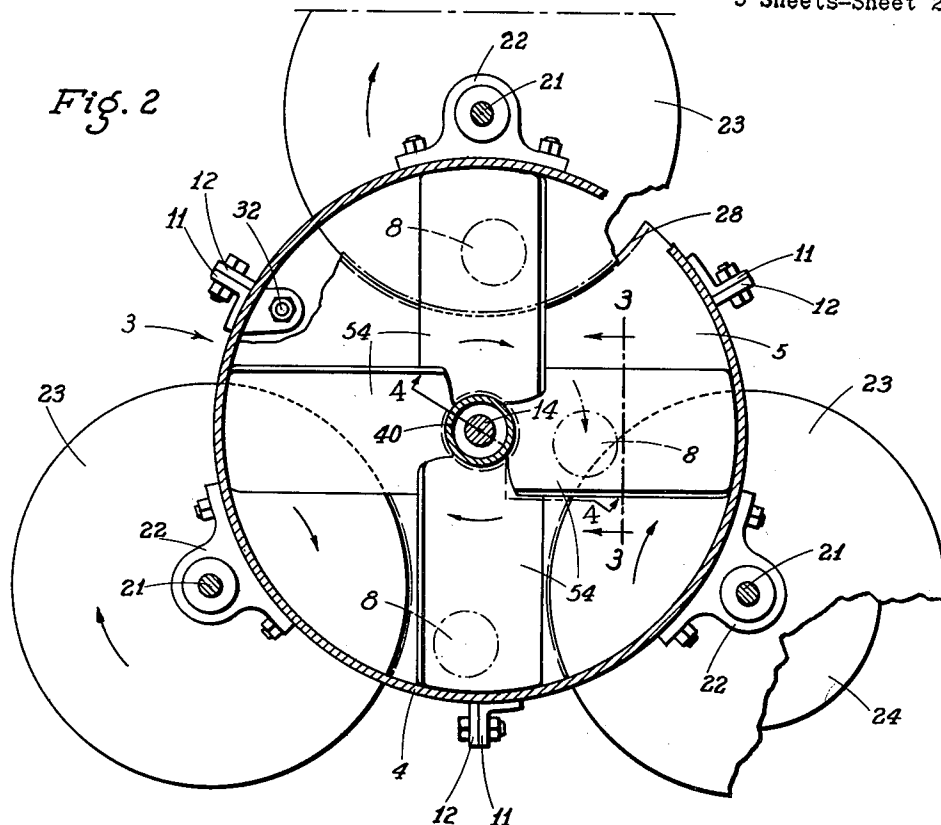
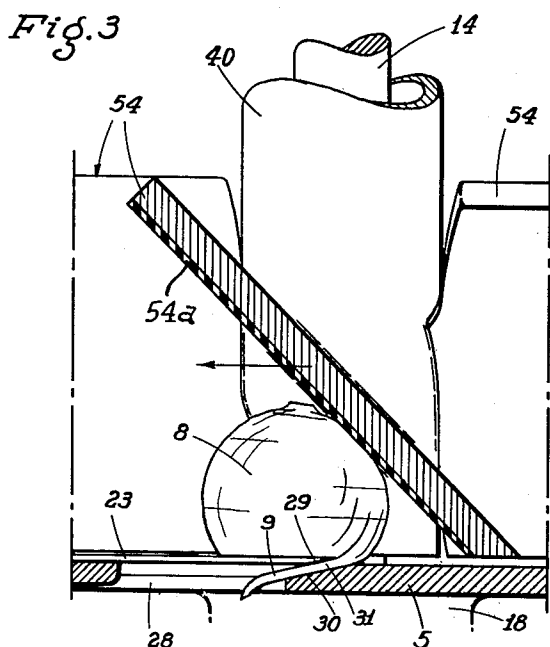
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Fig. 4

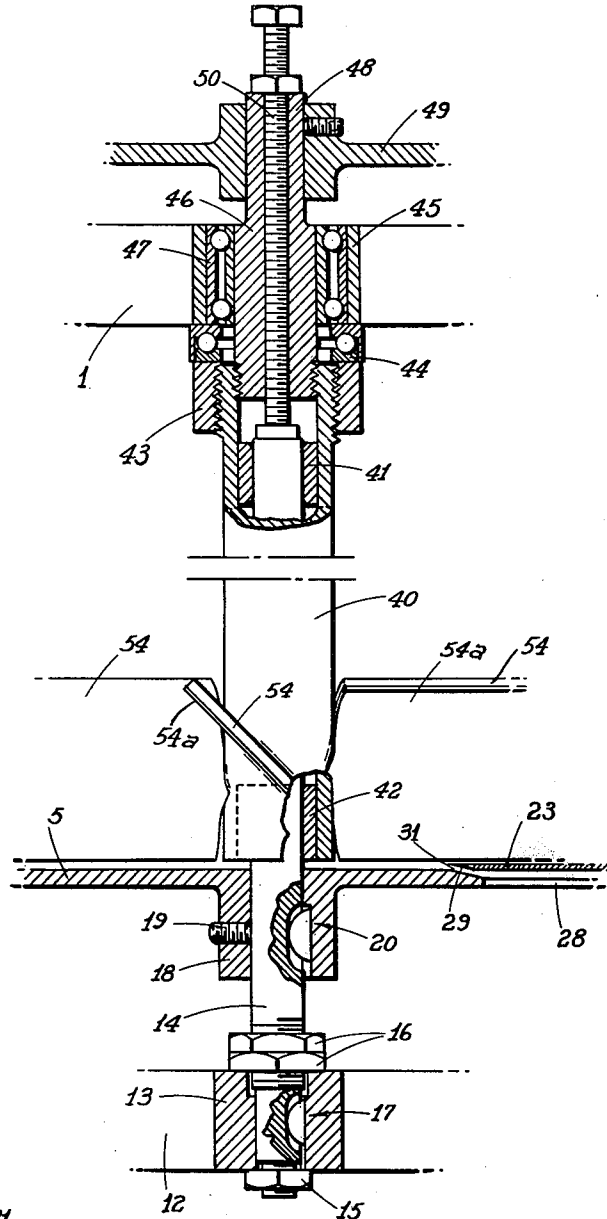
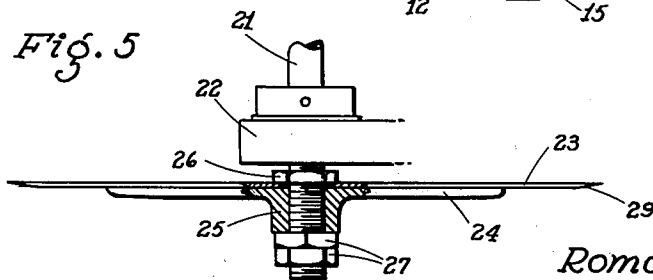


Fig. 5



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VERTICAL AXIS DISC ONION SLICER

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3 Claims. (Cl. 146—78)

The present invention is directed to, and it is a major object to provide, an improved machine for slicing fresh produce into thin slices; the invention being especially designed—but not limited—for use to slice fresh onions preparatory to dehydration of the slices.

Another important object of this invention is to provide a power driven onion slicer which is operative to thin-slice onions smoothly, rapidly, and without bruising or "chipping" the onions during the course of the slicing operation.

An additional object of the instant invention is to provide an onion slicer which embodies a novel rotary shoe assembly which is operative to constantly and positively advance the onions against the cutting edges of a plurality of horizontal, driven slicing discs; the latter being arranged in slicing slot-forming relation to corresponding openings in the bottom of a receptacle in which the onions are deposited, and in which receptacle the shoe assembly rotates about a vertical axis, and closely above said slicing discs.

Another object of the present invention is to provide a novel driven mount for the rotary shoe assembly.

Still another object of the invention is to provide novel means for adjustment of the driven slicing discs relative to the rotary shoe assembly, and adjustment of the bottom of the receptacle relative to the driven slicing discs; all whereby the machine can be set to cut slices which are of predetermined thickness, but very thin.

It is also an object of the invention to provide an onion slicer which is relatively simple in structure; being designed for ease and economy of manufacture and long service, with a minimum of maintenance or repair being required.

Still another object of the invention is to provide a practical and reliable onion slicer, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is a side elevation of the onion slicer as in use.

Fig. 2 is an enlarged sectional plan view on line 2—2 of Fig. 1.

Fig. 3 is an enlarged fragmentary transverse section taken on line 3—3 of Fig. 2; the view showing particularly one of the shoes advancing an onion into slicing engagement with one of the driven slicing discs.

Fig. 4 is an enlarged fragmentary elevation, mainly in section, showing particularly the mount for the rotary shoe assembly, and the manner of center-supporting the bottom of the receptacle below said assembly; the upper portion of said view being taken substantially on line 4—4 of Fig. 1, while the lower portion of the view is taken substantially on line 4—4 of Fig. 2.

Fig. 5 is an enlarged fragmentary elevation, partly in

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section, showing the manner of adjustably securing one of the driven slicing discs on the related vertical spindle.

Fig. 6 is an enlarged fragmentary elevation showing the mount for the bottom of the receptacle, including the central spindle and one of the peripheral adjustment screws.

Referring now more particularly to the drawings, and to the characters of reference marked thereon, the onion slicer comprises a horizontal frame 1 which spans between, and is supported by, fixed, transversely spaced beams 2. A cylindrical, open-topped receptacle, indicated generally at 3, is disposed below the frame 1, and said receptacle includes a cylindrical body 4 and a separate bottom plate 5. The receptacle 3 is rigidly suspended below the horizontal frame 1 by legs 6 attached to said frame and thence depending to connection with the outside of the body 4.

The frame 1 spans, diametrically, over the receptacle 3, and a chute 7 is disposed to feed whole onions 8 into the receptacle 3 and onto the bottom plate 5. The thin onion slices 9 which the machine produces, by means of the mechanism and in the manner hereinafter described, fall downwardly from the bottom of the receptacle into a hopper 10, whence said onion slices are carried off for subsequent processing, in any suitable manner.

The separate bottom plate 5 of the receptacle 3 is of substantially the same outside diameter as the cylindrical body 4, lying closely below the latter; such bottom 5 being mounted in connection with the cylindrical body 4 in the following manner:

A plurality of vertical side bars 11 are fixed to the body 4 at circumferentially spaced points and depend therefrom; said side bars 11 being fixed at their lower end to and supporting a horizontal spider 12 disposed in spaced relation below the bottom plate 5.

The spider 12 includes a central hub 13, and a fixed central spindle 14 is secured at its lower end in the hub 13 and thence extends upwardly into the body 4 to an upper end termination intermediate the top and bottom of the latter. The central spindle 14 is nonrotatably but vertically adjustably secured in the hub 13 by means of a lower nut 15, upper nuts 16, and a key assembly 17 arranged to permit of such vertical adjustment.

The bottom plate 5 is formed with a central depending hub 18 vertically adjustably secured to the center spindle 14 by a set screw 19, and a key assembly 20 which prevents relative rotation between the hub 18 and spindle 14, but which key assembly is arranged to permit of vertical adjustment of said hub.

The machine includes, with the bottom 5, a driven slicing disc assembly (see particularly Fig. 2) which comprises the following:

At equally and circumferentially spaced points on the outside thereof the cylindrical body 4 is fitted with vertical rotary spindles 21, held in place by vertically spaced journals 22 attached to said body; the spindles 21 projecting at the related ends above and below the top and bottom of said body 4.

At their lower end portions the rotary spindles 21 are each fitted with a rotary slicing disc 23 of substantial diameter; each such disc being backed, from below, by a circular supporting plate 24 having a hub 25 on the related rotary spindle 21. Each of such disc assemblies is vertically adjustably secured on the related spindle 21 by an upper nut 26 and lower nuts 27 threaded on said spindle.

As so mounted, an innermost portion of each of the slicing discs 23 projects under the cylindrical body 4 but to an extent such that said projecting portions of all of the discs remain in substantial spaced relation to each other.

The portions of the slicing discs 23 which project under the cylindrical body 4 run in close overlying and symmetrical relation to part-circle openings 28 cut in the bottom plate 5 inwardly from the peripheral edge thereof.

The slicing discs 23, which are adjusted so that their upper surface is slightly above the corresponding surface of the bottom plate 5, are each bevel-sharpened at the periphery, as at 29, with the bevel facing downwardly as shown in Figs. 4 and 5. The slicing discs 23 are of such diameter relative to the part-circle openings 28 that the beveled cutting edges 29 of said discs overlap, or lap to a limited extent, a downwardly and outwardly inclined working edge 30 formed on the bottom plate 5 about each of said part-circle openings 28. Additionally, the bottom plate 5 and slicing discs 23 are relatively vertically adjusted to an extent such that arcuate slicing slots 31 exist between the beveled cutting edges 29 of the slicing disc 23 and the inclined working edges 30 about the part-circle openings 28.

Accurate vertical adjustment of each of the slicing discs 23 on the related spindle 21 is accomplished by the means heretofore described, and as shown particularly in Fig. 5, while similar adjustment of the bottom plate 5 is accomplished by vertical adjustment screws 32 threaded upwardly through rigid ears 33 on the inner side of the bars 11; the screws 32 abutting the bottom 5 adjacent the periphery thereof and at circumferentially spaced points. By loosening the set screw 19 in the hub 18, and then manipulating the screws 32, the bottom plate 5 can be accurately set to the desired position.

The rotary spindles 21 are simultaneously driven, all in the same direction, whereby to rotate the slicing discs 23, in the following manner.

A bracket 34 projects from one end of the horizontal frame 1 and supports a mounting plate 35, on one side of which is secured a vertical axis electric motor 36. Pulleys 37 are secured to the upper ends of the spindles 21 above the receptacle 3, and a common endless belt 38 runs on all of said pulleys 37, thence extending to and turning about a drive pulley 39 on the shaft of motor 36. Thus, when motor 36 is in operation all of the slicing discs 23 are driven.

Within the receptacle there is an onion advancing, rotary shoe assembly, which is constructed as follows:

A tubular, rotary post 40 surrounds the portion of the fixed central spindle 14 within the receptacle 3; the post being turnably carried on said spindle by upper and lower bushings, indicated at 41 and 42, respectively. At the upper end of the tubular rotary post 40, which terminates below the frame 1, said post is fitted with a threaded-on thrust collar 43, which abuts against a thrust bearing 44, which in turn engages the lower end of a cage 45 fixed in the frame 1.

A short vertical shaft 46 is threaded into the upper end of the tubular rotary post 40, above the upper end of the spindle 14, and said shaft thence extends upwardly through an anti-friction bearing 47 in said cage 45. The shaft 46 includes, at its upper end a reduced-diameter, upwardly projecting neck 48 on which a pulley 49 is secured.

A long, vertical adjustment and locator screw 50 extends downwardly full-length through the neck 48 and shaft 46, projecting below the latter and abutting the upper end of the fixed central spindle 14. By adjustment of the screw 15 the tubular rotary post 40 is maintained in a fixed vertical position, but without restricting rotation of said post; the lower end of the latter terminating, at its lower end, in closely spaced relation to the bottom 5, while at the same time the thrust collar 43 is maintained in abutment with the thrust bearing 44.

The tubular rotary post 40 is driven, in the direction indicated by the arrow in Fig. 2, as follows:

Another vertical axis electric motor 51 is mounted on the plate 35 on the side opposite the motor 36; the motor 51 including a drive pulley 52 about which an endless

belt 53 is trained; such endless belt 53 extending to, and turning about, the pulley 49, whereby to impart a drive to said pulley, and consequently to the tubular rotary post 40.

At its lower end portion the tubular rotary post 40 is fitted with a plurality of equally and circumferentially spaced, radially projecting onion pusher or advancing shoes 54. The shoes 54 are of such radial extent that they run, at their outer ends, closely adjacent the inner wall of the cylindrical body 4, and said shoes are set, on the post 41, so that the leading faces of said shoes incline, from their lower edges, upwardly and forwardly relative to the direction of rotation (see Fig. 3).

At their lower edges the shoes 54 run very close to, but do not engage the top of, the slicing discs 23. The slicing discs 23 are adjustable relative to the shoes 54, and the bottom 5 is adjustable vertically relative to said slicing discs 23, all by means of the adjustment structures hereinbefore described.

The produce advancing shoes 54, which are wide faced vertically, may—if desired—be provided at the front with rubber or other resilient facing as shown at 54a in Fig. 3 to assure against any possible bruising of the onions as they are advanced by said shoes.

Operation

The above described onion slicer functions in the following manner:

The whole onions 8, as delivered by the chute 7, fall into the receptacle 3 and onto the bottom plate 5, whereupon said onions are advanced by the shoes 54 of the rotary shoe assembly. As the onions 8 are so advanced they in effect wedgingly engage between the forward inclined faces of the shoes 54 and the bottom 5, being thus advanced in a circular path within the receptacle 3 on said bottom of the latter. With such advance of the onions 8 they recurrently engage the cutting edges 29 of the driven slicing discs 23, with the result that relatively thin but clean-cut slices 9 are cut from said onions, with the slices passing through the slicing slots 31, and thence falling free into the hopper 10.

By reason of the wedging engagement of the onions 8 between the inclined faces of the shoes 54 and the bottom 5, said onions tend to remain, after the initial slices are cut therefrom, with the flat cut face downward, whereby further slices continue to be cut from the same face until the onions are fully sliced. It will be recognized that as the slicing continues on each onion it will progressively reduce in height, but such reduction is compensated for by the onion moving relatively rearwardly with respect to the engaged, inclined face shoe.

With the described machine, fresh onions, or the like, may be effectively, positively, and rapidly cut into relatively thin slices, yet without mutilating or bruising the onions, or without "chipping" the same into small pieces, and which might otherwise occur were not the onions maintained against free rolling action by means of the inclined shoes 54.

From the foregoing description it will be readily seen that there has been produced such a machine as will substantially fulfill the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the machine, still in practice such deviations therefrom may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

1. A produce slicer comprising a frame, a cylindrical receptacle mounted in connection with the frame; the latter including a part spanning diametrically of the receptacle at the top thereof, the receptacle including a separate circular bottom plate, a plurality of circum-

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ferentially spaced, vertical side bars secured to the receptacle and depending therefrom, a spider fixed in connection with and supported by the side bars below the receptacle, the spider having a central hub, a fixed central spindle secured in said hub and projecting upwardly through the bottom, the latter having a hub vertically adjustably secured to said spindle, a plurality of circumferentially spaced vertical spindles journaled on the outside of the receptacle and projecting a distance therebelow, slicing discs secured on the lower end portions of said spindles, the slicing discs being of a diameter such that an inner portion of each thereof projects to a substantial extent under the receptacle, the bottom plate having arcuate openings therein symmetrical and substantially matching said portions of the slicing discs which project under the receptacle, the upper surface of the slicing discs being disposed in a horizontal plane above the corresponding surface of the bottom plate, the cutting edges of said projecting portions of the discs and the corresponding arcuate edges of the bottom bordering said openings being symmetrical and defining slicing slots, a tubular post disposed centrally in the receptacle, the central spindle engaging in said post, means between the spindle and post arranged to maintain a predetermined vertical position of the latter without restricting rotation thereof, journal means between the post and said frame part adjacent the top of the receptacle, a plurality of circumferentially spaced, relatively wide-faced produce advancing shoes fixed on the post and radiating therefrom to outer end terminations adjacent the side wall of the receptacle, said shoes being disposed so that their lower edges, upon rotation of the post, sweep in clearance but closely adjacent relation to the upper surface of said projecting portions of the discs, the shoes having working faces which incline forwardly and upwardly from their lower edge portions, and means to separately but simultaneously rotate the disc spindles and said post.

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2. Drive means for the vertical-axis slicing disc of a produce slicing machine having a produce-receiving receptacle above the disc, said drive means including, with an axial spindle upstanding from the disc alongside the receptacle, means journaling the spindle in connection with the receptacle, a pulley on the spindle above the receptacle, a vertical-axis motor mounted in connection with the receptacle to one side of the same, a pulley on the motor horizontally alined with the first named pulley, and a belt engaging and extending between the pulleys.

3. Means to simultaneously drive the spindles upstanding from a plurality of slicing discs of a produce slicing machine which includes an upstanding produce receiving receptacle above the discs and about which the spindles are disposed in spaced relation, said drive means comprising pulleys on the upper end of the spindles above the receptacle, a vertical-axis motor mounted in fixed relation to the spindles to one side of the receptacle, a pulley on the motor in horizontal alinement with the spindle pulleys, and a belt engaging and extending about all said pulleys.

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