

Sept. 10, 1957

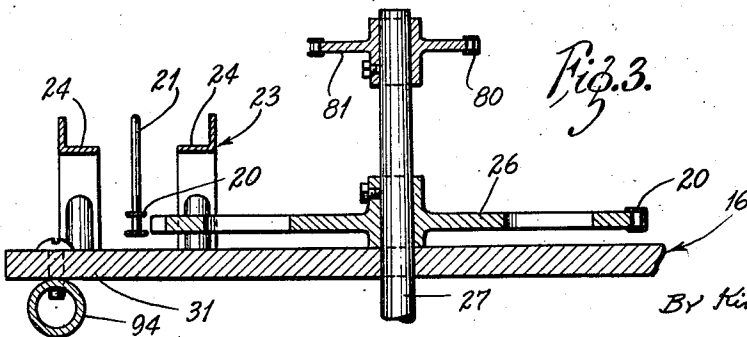
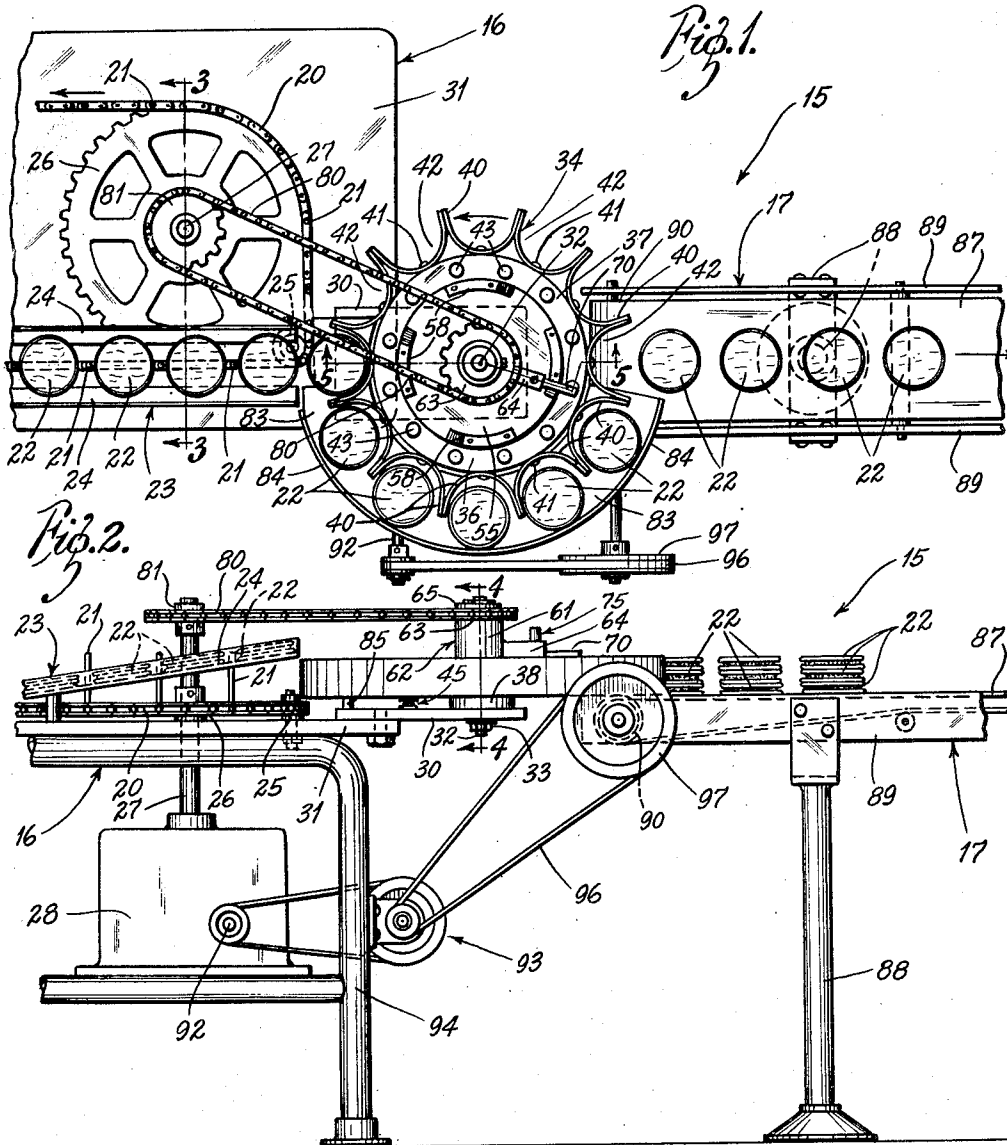
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2,805,756

STACKER FOR CRACKER-SANDWICHES OR THE LIKE

Filed Sept. 19, 1951

2 Sheets-Sheet 1



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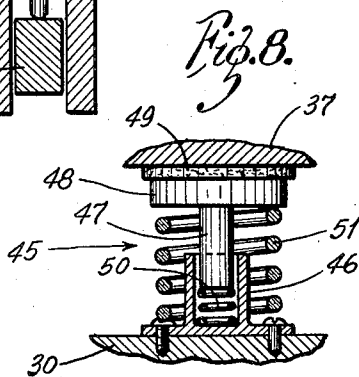
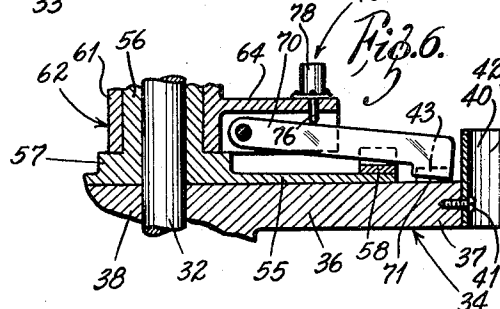
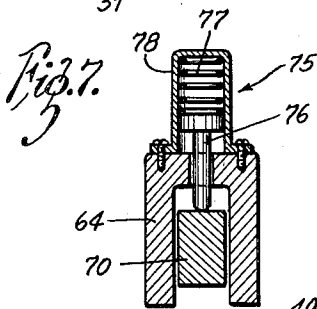
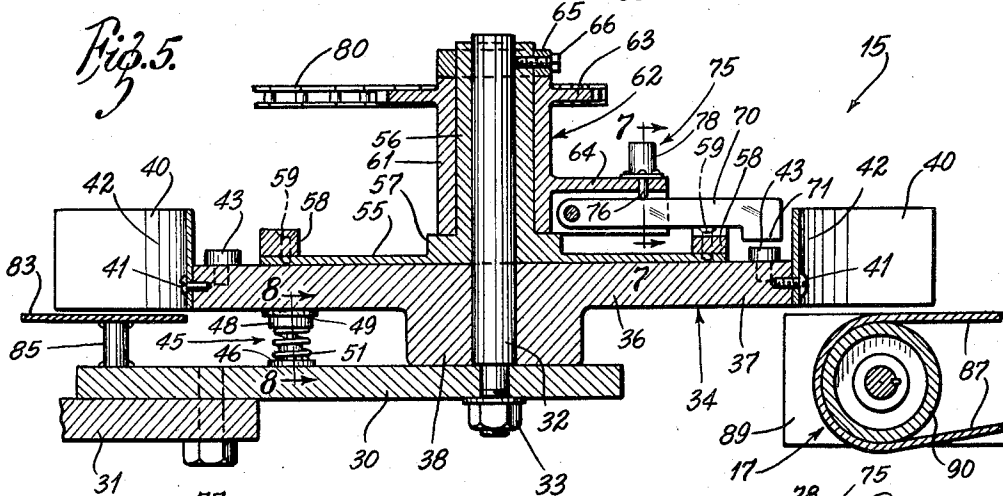
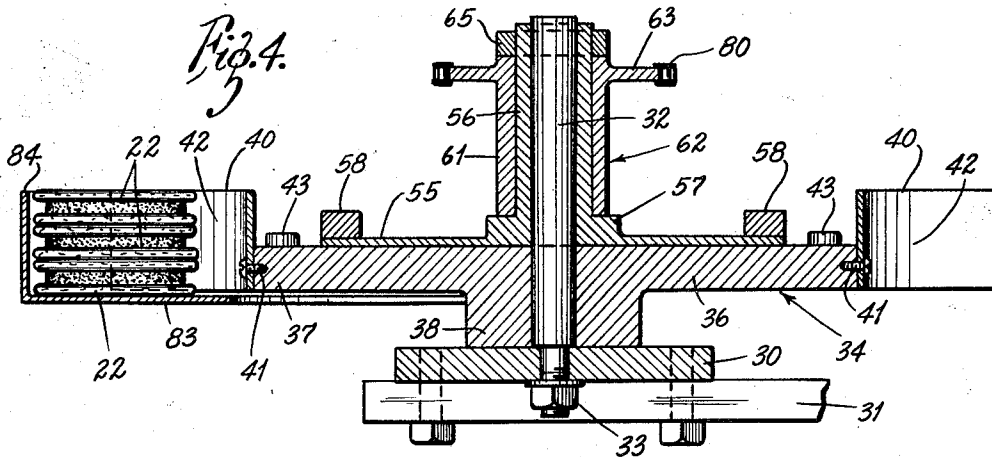
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STACKER FOR CRACKER-SANDWICHES OR THE LIKE

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2 Sheets-Sheet 2



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STACKER FOR CRACKER-SANDWICHES OR THE LIKE

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Application September 19, 1951, Serial No. 247,302

6 Claims. (Cl. 198—35)

The present invention relates generally to the conveyor art, and more particularly to a novel device adapted to receive freshly-made cracker sandwiches from a cracker sandwich machine and to deposit them in stacks upon a moving conveyor from which they may be gathered for packing.

Briefly, the present novel device is adapted to cooperate with a cracker sandwich making machine which delivers a continuous row of individual cracker sandwiches by means of a continuously moving conveyor. Cracker sandwiches thus delivered are deposited one at a time in a pocket-like recess at the periphery of a pocket wheel. This pocket wheel has recessed portions continuously around its periphery and is adapted to rotate intermittently, thus enabling a plurality of cracker sandwiches to be delivered into each recessed portion before the following recessed portion or pocket is disposed in position to receive subsequently delivered sandwiches. As the pocket wheel rotates in its periodic movement, it carries the received sandwiches in stacks to a point approximately diametrically opposite the point where they were received and deposits them on a moving belt conveyor. The desired periodic movement of the pocket wheel is attained by means of a continuously rotating finger driven from the drive shaft of the cracker sandwich machine and adapted to engage spaced indexing pins on the pocket wheel. The engagement of these pins is selective and adjustably by means of cam elements which provide a desired pattern of engagement of the rotating finger with the indexing pins.

It is an object of the present invention to provide a novel stacker for cracker sandwiches or the like which is adapted to receive individual cracker sandwiches from a cracker sandwich making machine and to deposit them upon a moving belt conveyor.

It is another object of the present invention to provide a novel stacker for cracker sandwiches or the like which receives individual cracker sandwiches and delivers them in stacks containing a predetermined number of sandwiches.

It is another object of the invention to provide a novel stacker for cracker sandwiches or the like which is adjustable to vary the number of sandwiches in each stack delivered therefrom.

Other objects of the invention are to provide a novel stacker for cracker sandwiches or the like which is automatic in its action, simple in its construction and adjustment, and which is otherwise well adapted to the purpose for which it is intended.

The foregoing and further objects and advantages will be apparent from the following description taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a plan view of a stacker constructed in accordance with the teachings of the present invention shown in cooperative relation with a portion of a cracker sandwich machine conveyor and a stack receiving belt conveyor;

Fig. 2 is a side elevational view thereof;

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Fig. 3 is an enlarged fragmentary sectional elevation taken generally along the line 3—3 of Fig. 1;

Fig. 4 is a further enlarged fragmentary sectional elevation taken generally along the line 4—4 of Fig. 2;

Fig. 5 is a fragmentary sectional elevation taken generally along the line 5—5 of Fig. 1, showing a rotating finger in position for non-engagement with an indexing pin;

Fig. 6 is a fragmentary sectional elevation of a portion of Fig. 5, showing the rotating finger in position for engagement with an indexing pin;

Fig. 7 is a still further enlarged sectional elevation taken generally on the line 7—7 of Fig. 5, showing a biasing assembly in cooperative relation to the rotating finger;

Fig. 8 is an enlarged fragmentary sectional elevation taken generally on the line 8—8 of Fig. 5, showing a drag brake assembly; and

Fig. 9 is a sectional elevation of a replaceable cam. Referring to the drawings more particularly by means of reference numerals, the numeral 15 generally designates a cracker sandwich stacker constructed in accordance with the teachings of the present invention. The stacker 15 is adapted to cooperate with a cracker sandwich machine 16 and a belt conveyer 17, receiving individual cracker sandwiches from the former and delivering them in stacks of predetermined height to the latter.

In the depicted embodiment, the stacker 15 is shown to be cooperative with a sandwich machine 16 having a moving pin type of conveyer in which a continuously moving chain 20 has spaced vertical pins 21, each adapted to move an individual cracker sandwich 22 up a ramp assembly 23 comprising spaced parallel angles 24. As the individual sandwiches 22 reach the high end of the ramp assembly 23, they are pushed off and allowed to drop onto the stacker 15 for collecting into stacks, as will appear. As the sandwiches 22 are pushed off the ramp assembly 23, the pins 21 along with the continuously moving chain 20 pass around an idler sprocket 25 and are thus disengaged from the sandwiches 22. The chain 20 may be driven by any convenient means, such as a sprocket 26 secured to a vertical shaft 27 of a prime mover 28. It will of course be understood that the above-described means for conveying individual cracker sandwiches to the stacker 15 is merely illustrative, the stacker 15 being equally well adapted for cooperation with other types of conveyer means.

The cracker sandwich stacker 15 comprises a mounting plate 30 adapted for attachment to a base plate 31 of the cracker sandwich machine 16. A vertical stub shaft 32 is firmly secured to the mounting plate 20, as by a nut and washer assembly 33, and forms a non-rotating center for a horizontally rotatable pocket wheel 34. The pocket wheel 34 comprises a wheel 36 having a disc portion 37 and a depending boss portion 38, the lower face of the latter resting for rotation upon the upper surface of the mounting plate 30. A plurality of crescent-shaped elements 40 are disposed around the periphery of the disc portion 37 and secured thereto by means of screws 41. As clearly shown in Fig. 1 of the drawings, these elements 40 are disposed in abutment one with another so as to form a series of pocket-like recesses 42 in the pocket wheel 34. Indexing pins 43 extending upwardly from the top surface of the disc portion 37 are arranged in equal spaced relation slightly inwardly of the periphery thereof, the number of indexing pins 43 so arranged being equal to the number of crescent-shaped elements 40.

A drag brake assembly 45, best shown in Figs. 5 and 8, comprises a socket member 46 appropriately secured to the upper surface of the mounting plate 30 and slidably receiving a pin portion 47 of a disc-like brake shoe 48. A leather cap 49, appropriately secured to the upper sur-

face of the shoe 48, slidably abuts the lower surface of the disc portion 37 of the pocket wheel 34, being continuously urged thereagainst by springs 50 and 51 disposed as clearly shown in Fig. 8.

A stationary cam disc 55 having an upstanding tubular portion 56 provided with a lower shoulder 57 is mounted on the stub shaft 32 above the wheel 36 and supports a plurality of spaced cams 58 adjacent its periphery. The cams 58 are arcuate in plan and have a vertical longitudinal cross section as clearly shown in Fig. 9, being removably secured to the cam disc 55 by means of screws 59.

A driving member 62 having a sprocket portion 63 and a radially extending bracket portion 64 is supported on the tubular portion 56 and the shoulder 57 of the cam plate 55 by a hub 61, as clearly shown in Figs. 4 and 5, and is retained thereon by a collar 65. A set screw 66 secures both the collar 65 and the cam plate 55 against rotation about the axis of the stub shaft 32 and serves further to maintain these elements in a desired vertical adjustment to prevent frictional binding of the wheel 36 or of the drive member 62. The bracket section 64 has a channel-shaped cross section, as clearly shown in Fig. 7, and receives a pivotally mounted finger 70 having a depending portion 71 for engagement with indexing pins 43, as will appear. A biasing assembly 75 secured to the bracket section 64 comprising a push pin 76, a spring 77, and an inverted thimble 78, all assembled as clearly shown in Fig. 7, continuously urges the finger 70 towards downward pivotal movement. The driving member 62 and the attached finger 70 are adapted to rotate continuously by means of a chain 80 connecting the sprocket portion 53 with a sprocket 81 secured for rotation with the shaft 27 of the prime mover 28.

A dead plate 83 having an upstanding external flange 84 is generally arcuate in shape and is disposed with its inner edge adjacent the periphery of the wheel 36 of the pocket wheel 34 so as to underlie the crescent-shaped elements 40 during a portion of their rotative movement, thus to cooperate with these elements 40 in defining pocket-like recesses 42. The dead plate 83 is supported from the mounting plate 30, as by an attachment 85. As is clear from Figs. 1 and 2, the end of the dead plate 83 which is remote from the sandwich machine 16 rests adjacent a belt 87 forming a part of the belt conveyer 17.

The conveyer 17 is of conventional type and may include a columnar supporting member 88, a frame assembly 89, and a belt drum 90. The drum 90 is preferably driven from the prime mover 28 at a speed which is appropriately coordinated with the movement of the pocket wheel 34. Fig. 2 depicts one arrangement wherein the drive for the drum 90 is derived from a secondary shaft 92 of the prime mover 28, passed through a conventional speed-reducing pulley assembly 93 secured to a frame 94 of the sandwich machine 16, and thence delivered by a belt 96 to a pulley 97 connected to the drum 90. Clearly, the belt conveyer 17 may be arranged to carry the stacked sandwiches in directions other than as shown in the drawings, the length of the dead plate 83 being appropriately determined by the desired direction of movement therefrom.

Operation

As above mentioned, the stacker 15 is adapted to receive individual cracker sandwiches 22 as they are pushed off the upper end of the ramp assembly 23 and to deliver the sandwiches in stacks of predetermined height to the belt conveyer 17. Accomplishment of this function is through the cooperative action of the continuously rotating finger 70, the cams 58, and the indexing pins 43. It has already been noted that the depending portion 71 of the pivotally mounted finger 70 is adapted to engage the indexing pins 43 and it is further obvious that when these elements are so engaged the rotative movement of the driving element 62 by virtue of its connection to the prime mover 28 will cause the pocket wheel 34 to be

rotated thereby. When, however, the finger 70 passes over one of the cams 58, it is pushed upwardly against the biasing action of the assembly 75 and is thus disengaged from the indexing pin 43. The drag brake assembly 45 causes the pocket wheel 34 to cease its rotative movement immediately upon disengagement of the finger 70 from an indexing pin 43, and the pocket wheel 34, therefore, remains stationary until the finger 70 has passed over the cam 58 and has rotated far enough to engage another indexing pin 43.

It is understood of course that the disposition of the cams 58 relative to the indexing pins 43 will be such that the pocket wheel 34 will be successively halted in positions to dispose the pocket-like recesses 42 directly opposite the end of the ramp assembly 23 of the sandwich machine 16. The operational sequence may be one of two preferred sequences. In stacking three cracker sandwiches 22, for example, in one sequence the first one is deposited as the pocket wheel 34 moved into register with the ramp assembly 23; and the second and third sandwiches are deposited while the pocket wheel 34 is halted, and both the first and last sandwich 22 are moved into pocket-like recesses 42 during movement of the pocket wheel 34, the first as the pocket wheel 34 completes one indexing movement and the last as the pocket wheel 34 begins the following indexing movement. Thus, normally the relationship of the parts is such for the latter operation that substantially the first half of the 30 degree movement of the pocket wheel 34 occurs as the third sandwich 22 of a stack moves through the second half of its deposit movement, and the second half occurs as the first sandwich 22 of the next stack moves through the first half of its deposit movement. However, desired deviations from this stated preferred relationship may be readily accomplished by changing the cam positions or the initial position of the finger 70.

The stacks of sandwiches 22 which rest upon the dead plate 83 are conveyed therearound during the intermittent rotation of the pocket wheel 34 and are finally pushed off onto the continuously moving belt 87 of the conveyer 17, the speed of the belt 87 being such as to remove each stack of sandwiches 22 from the vicinity of the discharge end of the dead plate 83 before the following stack is deposited thereon.

It will be noted that the depicted embodiment of the stacker 15 incorporates twelve each of the crescent-shaped elements 40 and the indexing pins 43, and four cams 58, the length and disposition of the latter being such that only every other indexing pin 43 can be engaged by the rotating finger 70, said engagement being maintained for 30 degrees of angular movement of the pocket wheel 34. It is apparent, therefore, that each successive movement of the pocket wheel 34 will dispose a recess 42 in position to receive sandwiches 22, and it is further apparent that the finger 70 will travel through an arc of 90 degrees in effecting an intermittent 30 degree movement of the pocket wheel 34. Clearly, then, if the angular velocity of the finger 70 be appropriately coordinated with the timed delivery of individual sandwiches 22, as for example to provide a 30 degree movement of the finger 70 for each delivered sandwich 22, a condition will obtain wherein if the pocket wheel 34 were rotated continuously by the finger 70, a separate recess 42 would be advanced to receive each delivered sandwich 22. This desired coordination of speed is preferably obtained through appropriate selection of the sprocket 81 and the sprocket portion 63. Inasmuch as the arrangement of cams 58 as above set forth provides for a 90 degree travel of the finger 70 for each 30 degree movement of the pocket table 34, not one, but three successive sandwiches 22 will be delivered into each recess 42, each stack of three sandwiches being eventually displaced upon the moving belt 87, as previously indicated.

Although only six of the twelve indexing pins 43 are engaged in the arrangement of the depicted stacker 15,

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the additional pins 43 provide flexibility of operation wherein stacks to a height of any number of sandwiches which is a whole factor of twelve may be accommodated, merely through the use of the required number of proper length cams 58. For example, stacks of four sandwiches can be obtained by arranging three equally spaced cams 58 so as to provide engagement of the finger 70 with each third indexing pin 43, stacks of six sandwiches 22 can be obtained by arranging two equally spaced cams 58 so as to provide engagement of the finger 70 with each fifth indexing pin 43, and stacks of two sandwiches 22 can be obtained by arranging six equally spaced cams 58 so as to provide engagement of the finger 70 with each indexing pin 43 in turn. In circumstances where it is desired to provide stacks of sandwiches or the like to heights other than a multiple of 12, the desired result can be easily achieved by employing a pocket wheel having an appropriate different number of recesses 42 and indexing pins 43.

Clearly, the device described herein fulfills the objects and advantages sought therefor.

It is to be understood that the foregoing description and the accompanying drawings have been given only by way of illustration and example, and that changes in the form of the elements, rearrangement of parts, and the substitution of equivalent elements, which will be readily apparent to one skilled in the art, are contemplated as being within the scope of the invention, which is limited only by the claims which follow.

What is claimed is:

1. In a stacker for cracker sandwiches or the like, in combination, movable means for receiving successively delivered cracker sandwiches, driving means for said movable means including a driving assembly adapted to rotate continuously, means in said assembly for engaging said movable means for intermittent movement of the same, means for disengaging said engaging means upon predetermined movement of said movable means, and means cooperative with said movable means for delivering said received sandwiches in uniform stacks to a point of discharge.

2. In a stacker for cracker sandwiches or the like, in combination, a wheel-like assembly adapted to rotate in a horizontal plane, said assembly including a plurality of pocket-like recesses at its periphery, a rotatable driving assembly disposed coaxially with said wheel-like assembly, said driving assembly including a radially extending element adapted for vertical reciprocatory movement, indexing means in said wheel-like assembly for intermittent engagement with said radially extending element, and stationary cam means for controlling said engagement in accordance with a predetermined pattern.

3. In a stacker for cracker sandwiches or the like, in combination, a wheel-like assembly adapted to rotate in a horizontal plane, said assembly including a plurality of pocket-like recesses at its periphery, a stationary dead plate of substantially arcuate plan disposed so as to underlie more than one but less than all of said plurality of recesses, means including a continuously rotatable assembly for driving said wheel-like assembly in intermittent rotative movement, said continuously rotatable assembly having a vertically movable radially extending element adapted for intermittent driving engagement with said wheel-like assembly, and stationary cam means for regulating said engagement in accordance with a predetermined pattern.

4. In a stacker for cracker sandwiches or the like, in combination, a wheel-like assembly adapted to rotate in a horizontal plane, said assembly including a plurality of pocket-like recesses at its periphery, a stationary dead

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plate of substantially arcuate plan disposed so as to underlie more than one but less than all of said plurality of recesses, means including a continuously rotatable assembly for driving said wheel-like assembly in intermittent rotative movement, said continuously rotatable assembly having a vertically movable radially extending element adapted for intermittent driving engagement with said wheel-like assembly, stationary cam means for regulating said engagement in accordance with a predetermined pattern, and brake means in frictional engagement with said wheel-like assembly for halting the same immediately upon each cessation of said driving engagement.

5. In a stacker for cracker sandwiches or the like, in combination, a supporting member, a fixed vertical shaft mounted therein, a pocket wheel disposed for rotation about said shaft, said pocket wheel including a plurality of spaced indexing elements, cam means comprising a plurality of circumferentially spaced cam elements disposed coaxially of said pocket wheel and secured to said fixed shaft, a driving assembly comprising a radially extending pivotally mounted finger disposed for rotation about said fixed shaft independently of said pocket wheel, said finger being intermittently engageable with at least a selected number of said plurality of indexing elements for intermittently driving said pocket wheel, said plurality of cam elements being successively effective to disengage said finger from said driving relationship, and brake means engaging said pocket wheel for normally maintaining the same motionless except when driven as aforesaid.

6. In a stacker for cracker sandwiches or the like, in combination, a supporting member, a fixed vertical shaft mounted therein, a pocket wheel disposed for rotation about said shaft, said pocket wheel including a plurality of spaced indexing elements, a dead plate mounted to said supporting member and adapted to underlie a portion of said pocket wheel, said dead plate including an upturned flange disposed radially outwardly of said pocket wheel and extending partially therearound, cam means comprising a plurality of circumferentially spaced cam elements disposed coaxially of said pocket wheel and secured to said fixed shaft, a driving assembly comprising a radially extending pivotally mounted finger disposed for rotation about said fixed shaft independently of said pocket wheel, said finger being intermittently engageable with at least a selected number of said plurality of indexing elements for intermittently driving said pocket wheel, said plurality of cam elements being successively effective to disengage said finger from said driving relationship, and brake means engaging said pocket wheel for normally maintaining the same motionless except when driven as aforesaid.

References Cited in the file of this patent

UNITED STATES PATENTS

764,632	Rhoades	July 12, 1904
766,234	Fidell	Aug. 2, 1904
1,556,991	Hippenmeyer	Oct. 13, 1925
1,676,639	Elliot	July 10, 1928
1,972,163	Pearson	Sept. 4, 1934
2,324,523	Lund	July 20, 1943
2,351,200	George	June 13, 1944
2,436,820	Nordquist	Mar. 2, 1948
2,496,438	Brandt	Feb. 7, 1950
2,556,214	Pottle	June 12, 1951
2,606,669	Morrison	Aug. 12, 1952
2,626,038	Smith	Jan. 20, 1953
2,684,161	Fay	July 20, 1954