Nov. 22, 1927.

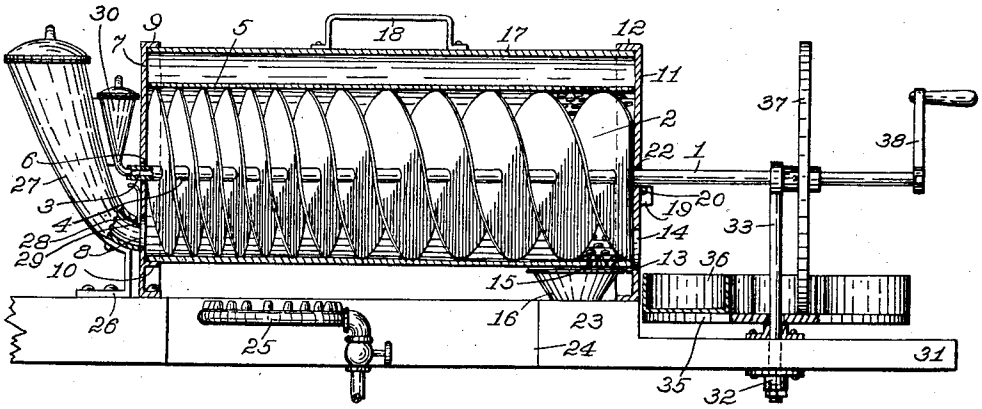
1,650,044

F. E. RICHARDSON

CORN POPPER

Original Filed June 16, 1924

Fig. 1.



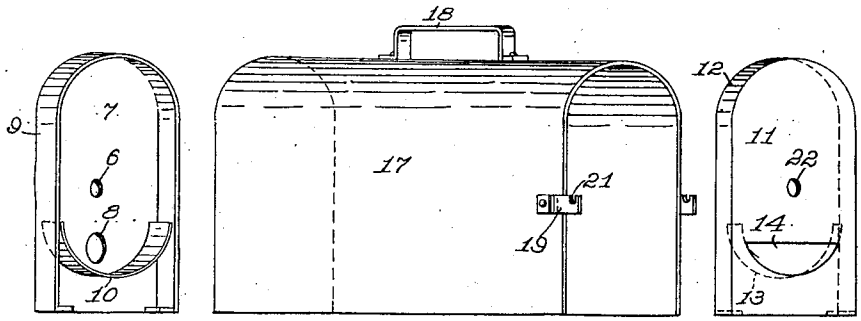


Fig. 2.

Inventor,
F. E. Richardson, by
G. C. Kennedy,
Attorney.

Patented Nov. 22, 1927. 1,650,044

UNITED STATES PATENT OFFICE.

FREDERICK E. RICHARDSON, OF MANCHESTER, IOWA.

CORN POPPER.

Application filed June 16, 1924, Serial No. 720,418. Renewed April 21, 1927.

My invention relates to improvements in inclosed conveyers, and the object of my improvement is to provide a device of this class which includes housed propelling means of the screw-conveyer type for specifically handling pop-corn while being roasted, or other materials for other uses as may be desired.

This object I have accomplished by the means which are hereinafter described and claimed, and illustrated in the accompanying drawings, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings, Fig. 1 is a vertical longitudinal axial section of my improved device, with elements of the same disclosed in side elevation, and with parts broken away. Fig. 2 is a perspective side elevation of the three housing sections as disassembled and spread apart in usual juxtaposition.

The device may be mounted upon any suitable support 23 having a recess or vertical opening 24, and having a depressed end or shelf 31. A sectional housing is mounted over said opening 24, the housing being open at the bottom so that a gas-burner 25 or any other heating means may be mounted in the opening beneath the housing. The main part 17 of the housing is of arched shape, longitudinally and horizontally elongated and provided with a handle 18.

End sections 7 and 11 of similar shape have flanges 9 and 12 respectively directed toward each other to inclose the end margins of the housing member 17.

An open ended substantially horizontal hollow cylinder 5 has its ends abutting upon and in fact closed by the end walls of the standard sections 7 and 11, and the section or standard 7 may have feet secured to the base 23 while the other end standard 11 may be removably secured upon the abutting end of the section 17 by means of a cross-rod 20 set in notches 21 in offset arms 19 projecting from the part 17 past said part 11.

Upwardly hollowed arcuate flanged seats 10 and 13 are fixed on the inner walls of the end sections or standards 7 and 11 respectively to fit and support the end parts of said cylinder 5. An axial solid stem 1 traverses the cylinder 5 to project from both ends thereof through bearing openings 6 and 22 respectively in said standards 7 and 11. At the right-hand a handled crank 38 is fixed terminally on the stem 1, whereby it may be manually rotated. The standard 7 has an inlet-port 8 positioned in communication with the lower part of the receiving end of said cylinder 5, and the other standard 11 has a relatively wide outlet- or discharge-port 14 in communication with the discharge end of the cylinder, at its lower part. A hopper 27 has its open diminished lower part in communication with the inlet-port 8, and is supported on a short standard 26. A small slide 29 is vertically slidable through a slot 28 in the hopper end with which to control the delivery thereof.

An Archimedean screw propeller 2 is fixedly mounted around the stem 1 within said cylinder 5 to have the outer edges of the spiral threads thereof in frictional contact with the inner wall of the cylinder and fitting tightly and removably so as to cause the cylinder to rotate with the same. While the threads 2 may be of the same pitch throughout I prefer to vary the pitch thereof in such a way as to gradually or progressively widen the same or the interspace of the threads in a longitudinal direction toward the delivery or discharge end of the cylinder 5. Therefore I have illustrated one mode of effecting this. The first few turns of the threads is taken at the same pitch, and thence toward or the whole length of the threads the pitch is changed by stages or steps to thus be progressively increased. The purpose of this will be explained hereinafter.

The delivery end part of the cylinder 5 is provided with circumferentially arranged rows of small apertures 15 for screening. A basin 16 may be placed therebelow to receive from said apertures. As the primary or specific use of my device is that of a corn-popper, some means for receiving the enlarged or expanded grains of the pop-corn at the delivery end of the cylinder to receive the discharge from the outlet-port 14 should be provided. I have shown means therefor, being a rotatable circular table 35 loosely mounted upon a vertical stem 33 at an axial opening, the stem 33 being fixed in a step-bearing or socket 32 of the shelf 31, so that the upper surface of the table 35 is below the level of the outlet-port 13 and close thereto, so that open top receptacles 36 on said table near or at its margin may be rotated past the port 14 to receive in turn therefrom till

regularly filled thereby. To automatically rotate the table 35 I have mounted a friction-disk 37 upon the rotatable stem or shaft 1 the edge of said disk bearing frictionally upon the upper surface of the table to rotate it at a speed ratio desired relative to the speed of rotation of the shaft 1.

The numeral 30 denotes a small conical container of liquefied butter whose lower diminished end delivers into an axial bore 3 in the left-hand end of the stem or shaft 1, and the latter has an angularly-directed passage from said bore to a port 4 which delivers into the cylinder between threads 2 a short distance beyond the end of the cylinder, where the butter may immerse the yet unexpanded kernels of pop-corn just delivered by the hopper 27.

The kernels are kept moving toward the discharge end of the cylinder when the stem 1 is rotated in one direction, turning the kernels over and over to subject their surfaces equally without burning to heat from the heater 25. The progressively widened interspaces of the threads 2 afford room for the expanding kernels as popped. Any unpopped kernels are delivered into the basin 16 through the apertures 15, the popped kernels being discharged through the outlet-port 14 into the moving receptacles 36. The housing is spaced from the cylinder and retains the heat, but its sections may be readily disassembled, as also the cylinder from the screw, for cleaning.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is:

1. A device of the character described, comprising a rotatably mounted hollow cylinder, an Archimedean screw of progressively widening pitch removably fixed therein to extend therethrough, a hopper adapted to deliver into the receiving end of the cylinder, and a receptacle to receive from the delivery end of said cylinder.

2. A device of the character described, comprising a rotatable hollow cylinder, an Archimedean screw fixed removably within the cylinder, a table rotatably mounted adjacent the delivery end of said cylinder to receive material therefrom carried through the convolutions of the screw while rotating in one direction, and driving connections between said rotatable cylinder and table.

3. A device of the character described, comprising a horizontal rotatable hollow cylinder, an Archimedean screw fixed removably therein, said screw having an axis projecting from its delivery end, a table rotatably mounted to marginally receive from said delivery end, and a friction-disk upon said axis in driving contact with said table to rotate the latter.

4. A device of the character described, comprising a horizontal rotatable hollow cylinder, an Archimedean screw removably fixed therein, supporting end-closures for the ends of said cylinder, one having an inlet-port, and the other having a relatively larger delivery-port, and the delivery end part of said cylinder having therearound numerous smaller delivery apertures for sifting purposes in the removing of smaller objects before the delivery through said delivery-port of larger objects.

5. A device of the character described, comprising a sectional open bottom housing, said housing having inlet- and outlet-ports at its opposite ends, a horizontal hollow cylinder rotatably mounted in, surrounded by, and spaced from said housing with its ends closed by the abutting end walls of the housing separably to receive from said inlet-port and to discharge by said outlet-port, a lengthwise constantly widening Archimedean screw mounted fixedly in said cylinder, and heating-means supported below said cylinder and housing.

6. A device of the character described, comprising a sectional open bottom housing, composed of separable end and intermediate parts, said housing having inlet- and outlet-ports in its opposite end parts, a horizontal hollow cylinder rotatably mounted in said housing with its ends closed by the abutting end walls of the housing to receive from said inlet-port and to discharge by said outlet-port, an axial stem traversing the cylinder and having an Archimedean screw thereon removably engaged with the inner walls of the cylinder to rotate therewith, the ends of the stem projecting through apertures in the end-walls of the housing, the stem at the receiving end of the cylinder having an axial bore extending a distance into the cylinder with a discharge passage into the cylinder, a hopper delivering into said bore and means for rotating the other projecting end of said stem.

7. A device of the character described, comprising a rotatable hollow cylinder, an Archimedean screw mounted fixedly and removably therein, a hopper delivering into the receiving end of said cylinder, another hopper delivering into said receiving end, the delivery end part of said cylinder having numerous wall apertures for screening purposes to remove smaller objects than are to be delivered from said delivery end opening, a heater below said cylinder, and a rotatable table mounted to receive from the delivery end of said cylinder only.

8. A device of the character described, comprising a housing open at the bottom, a hollow cylinder rotatably mounted in said housing, and an Archimedean screw of one diameter removably fixed in said cylinder, the convolutions of the screw having stages thereof shaped and arranged with progressively widening interspaces longitudinally

from its receiving toward its delivery end to afford increasing clearance for successively popping kernels.

9. A device of the character described, comprising a hollow cylinder supported for horizontal rotation, and an Archimedean screw mounted therein, different zones of the screw being differently widened longitudinally in a plurality of series of increasing lengths of interspaces toward the delivery end of the cylinder to increase clearance room for expanding propelled objects.

10. A device of the character described, comprising a hollow horizontally disposed cylinder, an axial stem traversing said cylinder to project from its ends, means on one end of said stem for rotating it, an Archimedean screw mounted on said stem and removably engaged with the inner wall of the cylinder with the pitch of the threads increased by stages progressively towards the delivery end of the cylinder beginning at a distance from the receiving end of the cylinder, to increase lengthwise clearance space for expanding bodies propelled by the thread and a hopper delivering into the receiving end of the cylinder.

11. A device of the character described, comprising a horizontally disposed hollow cylinder, an Archimedean screw fitted therein with its pitch increasingly and progressively widened from a distance from the receiving end of the cylinder, the delivery end part of the cylinder having circumferentially arranged numerous small screening apertures, and a sectional open bottom housing for said cylinder.

In testimony whereof I affix my signature at Waterloo, Iowa, May 23, 1924.

FREDERICK E. RICHARDSON.