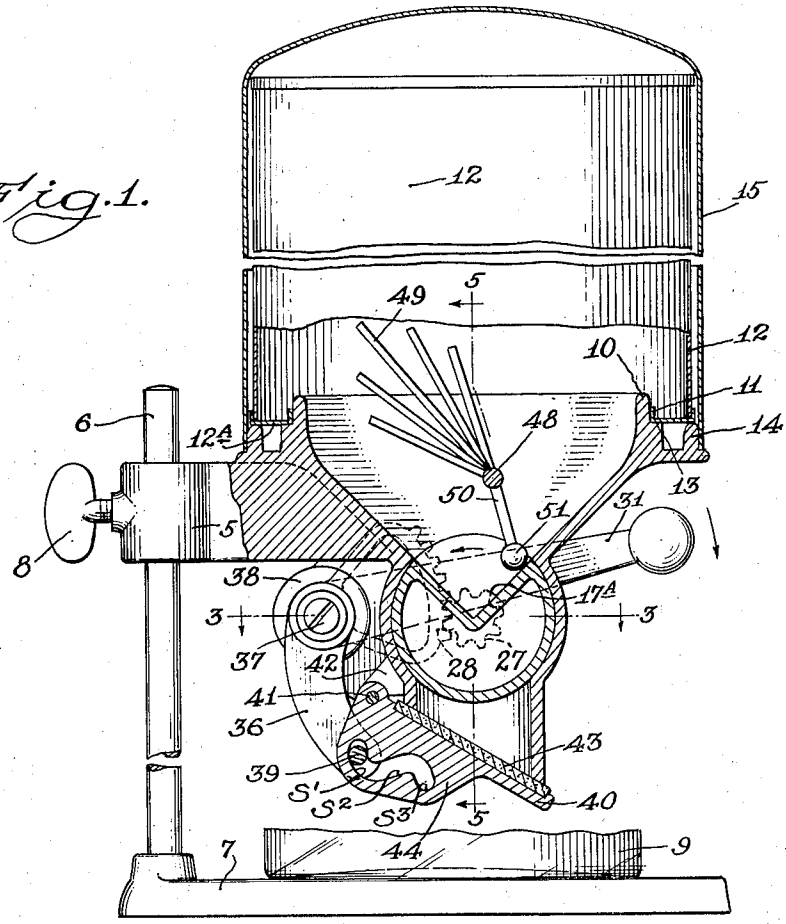
March 26, 1935. L. B. GREEN 1,996,044

DISPENSER FOR POWDERED COFFEE

Original Filed Feb. 23, 1932 2 Sheets-Sheet 1

Fig. 1.



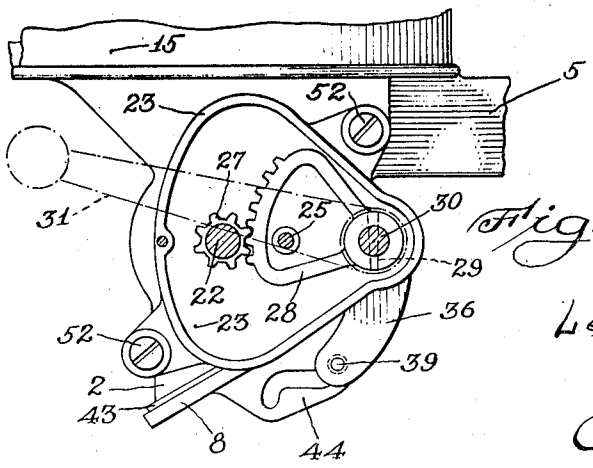


Fig. 4.

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DISPENSER FOR POWDERED COFFEE

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Fig. 3

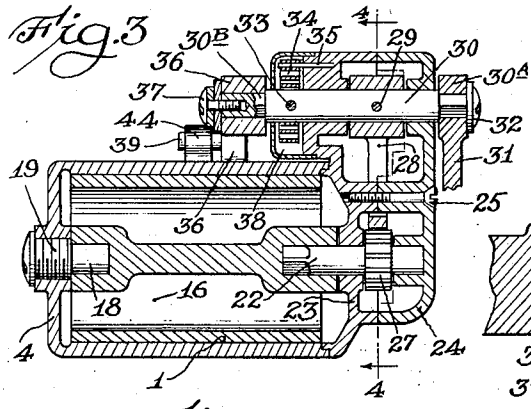


Fig. 6.

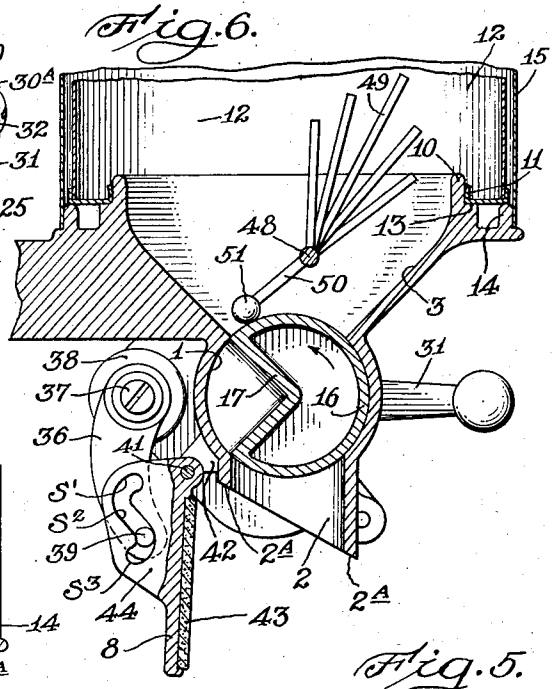


Fig. 7.

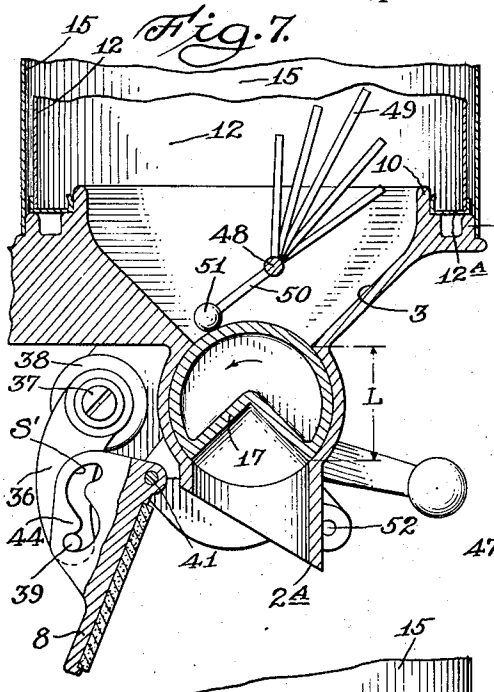
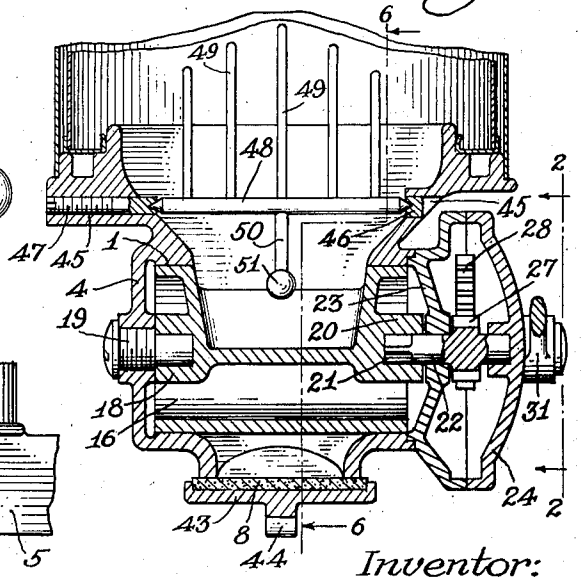


Fig. 5.



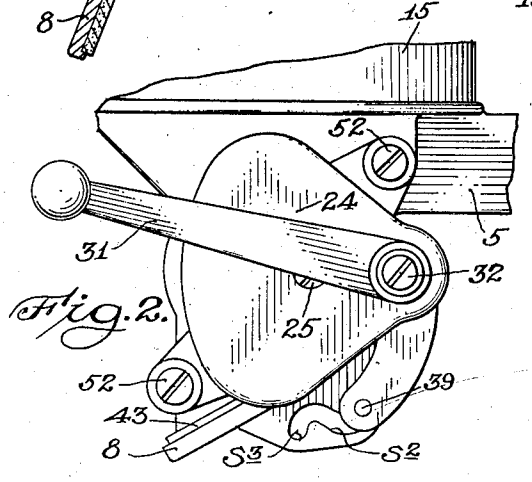


Fig. 2.

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UNITED STATES PATENT OFFICE

1,996,044

DISPENSER FOR POWDERED COFFEE

Lee B. Green, Lakewood, Ohio, assignor to The Globe Machine & Stamping Company, Cleveland, Ohio, a corporation of Ohio

Refile of application Serial No. 594,624, February 23, 1932. This application March 7, 1934, Serial No. 714,397

7 Claims. (Cl. 221—106)

This application is a refiling of my application #594,624, filed February 23, 1932 on a Dispenser for powdered coffee.

My invention relates to an appliance for dispensing a finely comminuted material in accurately measured quantities while continually sealing the supply of the material against the entrance of air to avoid a deterioration of the material either by the oxygen of the air or by moisture in the air.

Many food ingredients are readily affected by exposure to air and consequently are packed in cans provided with such tightly fitting covers that the contents of the cans are not altered so long as the covers have not been removed. However, with some materials, even the short time periods during which the cover must be detached from a can for access to the material is sufficient for permitting admitted air to influence the contents of the can.

Moreover, when a recipe calls for a measured quantity of such a material in a household term such as "a teaspoon" in proportion to a given quantity of a liquid or other material, the amount measured out by different users varies greatly because of commercial variations in the sizes of teaspoons and also because of the different heights to which the material in the spoon may extend above the level of its mouth edge.

To food connoisseurs, such variations in the actually measured out quantity make quite a substantial difference in the taste of the resulting product, and this difference in taste is also strongly affected when the material is modified by exposure to air. Such changes due both to quantity differences and to the effect of exposure to air are particularly noticeable in the case of pulverized coffee when prepared and treated (before it was packed in the sealed shipping can) so as to dissolve almost instantly in hot water.

And with a prepared product of such sensitive nature, the resulting changes in taste are further enhanced by the inadequate sealing which results when the user slips the cover of the can back rather loosely on the can, so as to avoid the use of requiring a tool to pry it off again.

In its general objects, my invention aims to overcome both the deteriorating and the irregular measuring of a comminuted product by providing an inexpensive, durable and easily manipulated appliance for dispensing the material directly from the can without the use of a spoon and without depending on the judgment of the user for the measured quantity, and which will effectively agitate the material so as to prevent any possible caking or lumping of the material from interfering with the accuracy of the measured quantity. Furthermore, my invention aims to provide a dispenser which will permit almost the entire contents of the can to be dispensed without admitting air to the interior of the can except during the quite short time required for attaching the appliance to the can after the cover has initially been pried off.

To accomplish these purposes, I provide my dispenser with these features:

(1) An inlet designed for speedy attachment to the mouth of the can containing the material, in sealed relation to this can.

(2) A supplemental sealing cover attached to the inlet end of the dispenser for housing the can and enhancing the exclusion of air from the can.

(3) A reciprocating dispensing member designed and arranged for segregating a highly uniform measured quantity of the material at each actuation of this member.

(4) A disposition of this dispensing member so that its measuring pocket is momentarily sealed from both the inlet and the discharge spout of the dispenser during the actuation of the dispensing member, so as to prevent air from passing from the discharge spout through this pocket to the supply of material both during the dispensing movement of that member and during its return movement.

(5) A journaling of a rotating dispenser member which will permit an extremely close fitting of this member in parts adjacent to it, without having that member bind or stick.

(6) An agitator disposed within the dispenser and automatically moved during both the initial and the final portions of each reciprocation of the dispensing member, for insuring the fineness of the material in the measuring pocket.

(7) An agitator also arranged for reaching into the can, so as to insure a ready feeding of the material from the can.

(8) A sealing of the discharge (or spout) end of the dispenser whenever the dispensing member is not moving, and an automatic opening and closing of this spout seal during each reciprocation of the dispensing member.

(9) A timing of this movement of the spout seal so that the discharging material will not be engaged and deflected by it.

(10) A shaping of the spout in relation to the direction of the discharge of material from the measuring pocket, to prevent the discharged material from being scattered beyond the mouth of

a glass or other receptacle positioned under the spout.

(11) A simple mechanism for manually actuating the dispensing member, the spout sealing member and the agitator in timed relation to one another.

(12) A positive stop arrangement associated with this mechanism, for informing the user that the mechanism has been fully actuated.

(13) A simple and effective spring arrangement for automatically retracting the mechanism when the actuating pressure is relaxed.

(14) An effective housing for the less easily cleaned parts of the mechanism, and an arrangement permitting a unitary manual detachment of this housing and of the parts enclosed by it for access to the dispensing member.

(15) A mounting of the dispensing member which enables this to be manually removed when the mechanism housing has been detached, so as to permit a complete cleaning of the passage portions through which the material moves.

Illustrative of a dispenser including all of these features, the accompanying drawings show an embodiment of my invention designed for household use in the dispensing of powdered coffee direct from the can in which the coffee is sold, which embodiment also includes a stand supporting the dispenser proper. In these drawings,

Fig. 1 is a front elevation of this dispenser and of a material receptacle of a customary can type attached to it, partially in central vertical section.

Fig. 2 is a fragmentary rear elevation of the same.

Fig. 3 is a horizontal section taken along the line 3—3 of Fig. 1 and looking downwards.

Fig. 4 is a vertical section taken through the mechanism housing along the line 4—4 of Fig. 3.

Fig. 5 is a vertical section taken along the line 5—5 of Fig. 1.

Fig. 6 is a vertical section along the line 6—6 of Fig. 5, taken when the actuating member has been moved to the middle of its dispensing movement.

Fig. 7 is a section similar to Fig. 6 but taken at the end of the dispensing movement of the actuating member.

In the illustrated embodiment, my dispenser includes a body which has an upright bore and which also has a horizontal cylindrical cross-bore 1 (Fig. 6) extending across the axis of this bore to connect the bore of the lower portion of the body (in the form of a spout 2) with an upwardly flaring hopper 3, the body having a front wall portion 4 (Fig. 5) closing one end of the cross-bore 1. Extending laterally from the flaring hopper 3 is an arm 5 through which a riser stem 6 on a stand base 7 extends, this stem being clamped to the arm 5 by a thumb-screw 8 at a suitable height above the stand base 7 to permit a tumbler 9 (or other material-receiving receptacle) to be slid under the spout 2 with sufficient clearance to permit a spout-closing gate 8 to swing freely above the tumbler.

The upper end of the hopper 3 leads to a top portion of the body which includes an inner and upright tubular portion 10 formed for tightly fitting into the usual cylindrical flange 11 in the top 12A of a material can 12 when the can is inverted with respect to the dispenser. This body top portion also includes an annular stop shoulder 13 for engagement by the adjacent portion of the top 12A of this can when the can is slipped down over the said flange. In addition, the top portion of the body includes an outer annular riser 14 tightly fitting the lower end of a cap-like metal cover 15.

Thus arranged, the stand and body assembly can be bodily inverted so as to insert the hopper mouth flange tightly in the can top flange 11, after which the resulting assemblage is turned upright so that material from the can flows into the hopper. Then the cover 15 is slipped loosely over the can tightly upon the riser 14 of the hopper top to afford a supplemental seal for excluding air both from the can and from the hopper.

Disposed within the cross-bore 1 and rotatably fitting the portions of this cross-bore between the spout 2 and the hopper 3 is a generally cylindrical dispensing member 16 which has its peripheral surface interrupted by a normally upwardly facing pocket 17 of a capacity corresponding to the amount of material which is to be measured out by each actuating movement of the dispensing member.

Each end of the dispensing member has its radially inner portion formed to afford a hub having an axial bore, and the bore of the forward hub 18 is journaled on the cylindrical inner end of a screw 19 which is threaded into the cross-bore-closing hopper member portion 4. In the rearward hub 20 the bore includes a portion 21 of square (or other non-circular section) fitting the inner end of a pinion shaft 22 which is journaled in backs 23 and 24 of both of two shallow cap-like parts of a mechanism housing. These two housing parts have their mouth ends abutting against each other (as shown in Figs. 3 and 5) and are fastened to each other by a screw 25 (Figs. 3 and 4), which screw also cooperates with the pinion shaft 22 in alining these mouth ends with each other.

Disposed within this two-part mechanism housing and fast upon the pinion shaft 22 is a pinion 27 meshing with a segmental gear 28 which is here shown (Fig. 4) as hollow so that the screw 25 connecting the two parts of the mechanism housing can extend freely through this gear. The gear 28 is fastened (as by the pin 29 of Figs. 2 and 4) to a gear shaft 30 which extends through and is journaled in the backs 23 and 24 of the two parts of the mechanism housing as shown in Fig. 3.

The rear end 30A of this gear shaft non-rotatably fits a cross-bore in one end of an actuating lever 31 which is clamped to the gear shaft by a screw 32. Fastened to the forwardly projecting portion of the gear shaft 30 adjacent to the forward cap-like part 23 of the mechanism housing (as by a pin 33) is the inner end of a mechanism-retracting spring 34 which is spiraled around this shaft and interlocked at its other end with a pin 35 socketed in the forward housing part 23, this spring being housed by a spring cover 38 fitting a portion of the housing part 23.

The forward end portion 30B of the gear shaft likewise non-rotatably fits into a cross-bore in one end of a gate-actuating arm 36 which is clamped against the end of the gear shaft by a screw 37. The arm 36 has at its other end a forwardly projecting pin 39 which moves in a slot S formed in an upright web 44 forming a part of a gate 40 which is pivoted on a pin 41 projecting forwardly (and parallel to the axis of the gear shaft 22) from the hopper member, and which gate normally closes the lower end of the upright bore of the body.

The lower or discharge end of the spout 2 is

preferably oblique to the axis of the spout and disposed so that the spout is quite short at the side 2A adjacent to the gate-pivoting pin 41 but considerably longer at the diametrically opposite side 2A, the axis of the pin 41 desirably being slightly higher than the shortest portion 2A of the spout.

The gate-moving pin 39 which projects from the gate-actuating arm 36 is spaced from the gear shaft 22 by a considerably greater distance than the spacing of this shaft from the pin 41 on which the gate is pivoted, so that a relatively short rotational movement of the gear shaft (by depressing the actuating member 31 against the resistance of the spring 34) will suffice for swinging the gate through the much larger arc needed for swinging the gate entirely out of the path of the material discharged from the spout. Furthermore, I arrange the operative connection between the gate-actuating arm 36 and the gate so that the gate will be swung entirely out of alinement with the bore of the spout before the dispensing member even begins to discharge material into the spout.

To secure such a timed movement of the gate, I make the slot in the gate web 44 only slightly wider than the diameter of the arm pin 39 which extends into this slot, and form this slot (which is generally designated as S) of such an S-shaped pitchline and of such a length that its wall portions transmit the following operative effects from the pin 39 on the gate-actuating arm to the gate:

When the dispenser is idle, as in Fig. 1, the pin 39 is within the upper portion S^1 of the slot and the retracting spring 34 tends to rotate the gear-shaft (on which the gate-actuating arm 36 is fast) in a direction which is counter-clockwise in Fig. 1, thereby also tending to swing the arm 36 in the same direction and hence pressing the pin 39 against the right-hand wall of this upper slot portion so as to hold the gate in its spout-closing position. By making this upper slot portion sufficiently long so that the pin 39 is still spaced from the upper end of the slot when the gate is closed, I employ the engagement of the gate with the lower end of the spout as cam means for halting the movement of the entire mechanism in the spring-retracted direction. This clearance between the pin and the upper slot end also allows for a possible compression of a gate-facing 43 which may be of soft rubber.

During the downward movement of the operating arm 31, both this arm and the gate-actuating arm 36 swing in a clockwise direction in Fig. 1, and the pressure of the pin 39 against the left-hand wall of the upper slot portion rocks the gate also in the same direction. However, the upper slot portion S^1 is relatively short so that this pin soon enters the middle slot portion S^2 which is oblique to the upper slot portion so that the pin engages the wall of this middle slot portion which was at the bottom in Fig. 1, thereby rapidly swinging the gate entirely out of alinement with the bore of the spout.

By suitably proportioning the obliquity between the upper and middle slot parts I cause the gate to be moved to this extent by the time the operating arm 31 reaches the middle of its stroke, as shown in Fig. 6. Then I dispose the lower slot portion S^3 so that a further movement of the gate-actuating arm in the gate-opening direction causes the pin 39 to enter this lower slot portion and to engage the extreme lower end of the slot (as shown in Fig. 7), so that this engagement of the pin with a slot end halts the dispensing movement of the entire mechanism in a position in which the measuring pocket is downwardly directed and opens entirely into the spout.

Moreover, I preferably make the arcuate width L (Fig. 7) of each of the two opposed side portions of the cross-bore 1 of the dispenser body (which are parts of a cylindrical surface corresponding closely to the cylindrical surface of the dispensing member 16) at least equal to the arcuate width of the measuring pocket 17.

With these parts thus proportioned, a rotation of the dispensing member from its normal position of Fig. 1 to its mid-stroke position of Fig. 6 not only measures out and segregates an exact quantity of the material fed to that member by the hopper 3 but also seals this segregated portion of the material both from the hopper 3 and from the spout 2. Consequently, air cannot pass upward from the spout through the measured material to the hopper during the dispensing operation.

When the dispensing member is then rotated further in the same direction, namely from the position of Fig. 6 to that of Fig. 7, the direction of rotation is such that the measuring pocket 17 first opens into the spout at the shorter sided edge of the latter. However, in the ordinary manipulation of the dispenser, the rotation of the dispensing member is so fast (particularly when the pinion 27 is of much smaller radius than the segmented gear 28) that the momentum due to this rotational movement will throw the discharged material toward the longer side of the spout. Consequently, I readily prevent a scattering of the dispensed material beyond the mouth of the tumbler or other receptacle into which it is to be discharged, while still providing sufficient clearance below the spout so that the gate will freely clear the tumbler.

To avoid having possible lumps of the material interfere with the exactness of the measuring of the dispensed quantity, I also desirably provide an agitator, and I arrange this agitator so that it will be operated in automatic response to the oscillating movement of the dispensing member without complicating the mechanism.

For this purpose, I form another cross-bore in the hopper member above and parallel to the cross-bore 1 in which the dispensing member rotates, thereby forming two lateral and alined bores 45 in opposite wall portions of the hopper. In one of these bores I firmly socket a stationary bearing 46, and through the other I thread a bearing screw 47. The inner ends of the bearing 46 and the screw 47 each have a conical recess, for respectively receiving the pointed ends of the shaft 48 which has agitator arms 49 extending from it, these arms being spaced along the shaft and desirably extending at right angles to the latter at varying and generally upward directions.

Fastened to and extending downwardly from the agitator shaft 48 is a weight arm 50 having a weight 51 fastened to its lower end; the length of the arm 50 being such that the weight 51 will extend into the measuring pocket 17 when this pocket faces upwardly, and also such as to permit the weight to be swung out of this pocket when the dispensing member is rotated. Moreover, the disposition of the agitator arms with respect to the weight arm 50 is preferably such that the center of gravity of the total agitator arms is offset from the axis of the weight arm in the lateral direction in which the mouth of the measuring pocket initially moves during the operation of

the dispenser, thereby causing the weight to bear against the other side wall of the dispensing pocket (as shown in Fig. 1) when the dispenser is idle.

With the agitator thus arranged, a rotation of the dispensing member causes the weight-engaging wall 17A of the measuring pocket to swing the actuator in a direction which is clockwise in Fig. 1; and as the weight 51 approaches the opposite side of the connection of the hopper to the cross-bore in which the dispensing member rotates, the weight is swung out of the pocket to a position in which it thereafter rides on the cylindrical exterior of the dispensing member, as shown in Figs. 6 and 7. During the return movement of the dispensing movement, the weight swings back into the dispensing pocket as soon as that movement is somewhat beyond the position shown in Fig. 6, after which gravity will cause the weight to bear against the then rotationally forward side wall of the measuring pocket so as to return the agitator to the position of Fig. 1.

Thus arranged, the agitator automatically operates during both the initial and the final portions of each reciprocation of the operating member 31. In practice, some of the agitator arms 49 (which may be thin and light wires) desirably extend upwardly beyond the hopper member into the can from which the material is being dispensed, so that they will also loosen the material within the can, as shown in the drawings. By providing the conically recessed bearings 46 and 47 for respectively receiving the two pointed ends of the shaft 48 and threading one of these (47) into the hopper wall so that it can be adjusted as to its distance from the other bearing, I obtain a sensitive journaling of the shaft and also permit the entire agitator to be inserted as a unit into the hopper.

With my dispenser thus constructed, it will be noted from Figs. 2 and 3 that the gear and pinion are enclosed by the housing which also has the pinion shaft and the gear shaft journaled in it, and that the operating arm 31 as well as the gate-actuating arm is fast on this gear shaft. Consequently, the major portions of the operating mechanism can speedily be detached as a unit from the hopper member by removing the two screws 52 which fasten this mechanism-housing to the hopper member.

During the detaching of this unit, the gate-moving pin 39 slides out of the gate slot S, so that the gate can then depend freely by gravity; and the pinion shaft 22 also slides out of the adjacent hub 20 of the dispensing member, so that the latter member can be slid out by grasping this hub, thereby permitting the user to examine and clean the entire bore of the hopper member and also to clean the measuring pocket. Moreover, a partial retraction of the bearing screw 47 will permit the agitator member to be detached also if this should be desired, so that my entire dispenser can easily and speedily be cleaned, in addition to being easily assembled.

Since the dispenser body, the dispensing member, the two-part mechanism housing, the segmental gear, operating arm, gate-actuating arm, and the unitary pinion and pinion shaft all can be accurately made as die castings, my entire dispenser requires very little machining in the manufacture of its parts. Consequently, it can be built at a relatively low cost while still affording a highly uniform dispenser. And, since these die castings may be of light alloys, the dispenser also can readily be of such small total weight as to be easily inverted for the needed attaching to a material container.

Moreover, it will be noted from the drawings that my dispenser can readily be built in a quite compact form and with the parts proportioned so as to require only a short depressing movement of the operating member even when this member is considerably longer than the radius of the segmental gear so as to afford added leverage. Consequently, only a rather light touch is required for the dispensing operation, and the positive halting of the movement eliminates all dependence on the user's judgment for the accuracy of the dispensing.

With the dispensing member of my appliance designed for rotatably fitting the cross-bore of the body, this in itself might suffice for journaling the dispensing member; but I preferably employ the auxiliary stub-shafts (namely the screw 19 and a part of the pinion shaft 22) for this purpose so that the periphery of the dispensing member can be of a diameter exceedingly close to that of the cross-bore in the dispenser body without having that member bind in the bore.

However, while I have heretofore described an embodiment of my invention including numerous desirable details of construction and arrangement, I do not wish to be limited in these respects, since many changes might be made without departing either from the spirit of my invention or from the appended claims. Nor do I wish to be limited to the conjoint use of all novel features of my invention.

I claim as my invention:

1. A dispenser including a tubular body having its lower portion formed to afford a discharge spout, a dispensing member housed by the body and intercepting the bore of the body, the said member being movable for dispensing a measured quantity of material in the spout; a gate movably supported by the body and normally closing the outlet end of the said spout, and a mechanism for conjointly moving the dispensing member and the gate, the gate having a cam slot in a part thereof and the said mechanism including a swinging arm and a pin projecting from the said arm into the slot, the pin being disposed for engaging the longitudinal walls of the slot to move the gate; the slot having an S-shaped pitch line and being so disposed with reference to the outlet end of the spout that an actuation of the mechanism moves the gate at a higher rate of speed during the major part of the opening movement of the gate than during the final portion of this movement.

2. A dispenser as per claim 1, in which the slot portion in which the pin is disposed when the spout end is closed by the gate presents a slot end then freely spaced from the pin, so as to allow for wear on the spout-closing face of the gate.

3. In a dispenser, a hopper, a dispensing member movable with respect to the hopper and having a pocket normally facing the hopper, and an agitator including a shaft journaled in the hopper and extending horizontally across the bore of the hopper above the dispensing member and at right angles to the direction in which the pocket of the dispensing member moves when dispensing material from the hopper, a rigid arm fast upon and normally depending from the shaft into the said pocket and adapted to be moved by engagement with a wall of the pocket so as to move the said shaft rotationally, and rigid agi-

tator fingers spaced longitudinally of and fast with respect to the said shaft and extending in generally upward directions from the said shaft.

4. In a dispenser, a hopper, dispensing member and agitator assembly as per claim 3, in which the shaft is fast with respect to the said arm, including two relatively adjustable bearings respectively mounted in opposite side portions of the hopper, the shaft having its opposite ends respectively journaled in the said bearings.

5. A dispenser for comminuted materials comprising a body having a normally upright bore intercepted by a cross-bore extending into the body from one side of the latter so that the upright bore presents an upper hopper bore portion connected by the cross-bore to a lower spout-forming bore portion, a dispensing member rotatably fitting the cross-bore for delivering a predetermined quantity of material from the hopper portion to the spout portion; a housing mounted on the said side of the body for closing the mouth end of the cross-bore; and a mechanism for oscillating the dispensing member; a stub shaft extending inwardly from the opposite side of the body coaxial with the cross-bore and having one end of the dispensing member journaled thereon, and also including a second housing detachably fastened to the body; and a mechanism including a shaft journaled in the second housing and coaxial with the cross-bore, the last named shaft being interlocked with the other end of the dispensing member, and the said shafts cooperating to journal the dispensing member independently of the rotatable interfitting of the dispensing member with the cross-bore.

6. A dispenser for comminuted material, comprising an upright tubular body for direct attachment in sealing relation to the mouth of an inverted material container which has an end opening bordered by an annular end portion and also by an inwardly directed tubular flange, the body having a cross-bore intercepting the bore of its tubular formation; a dispensing member disposed within the said cross-bore and movable for transferring a measured quantity of material from the upper portion of the body to a lower portion thereof; and a cover for housing the container; the upper end of the body including a tubular portion snugly fitting the said flange of the container, and a relatively lower and larger diametered upright tubular portion upon the upper end of which the annular end portion of the container seats and which tubular portion fits slidably into the mouth of the cover.

7. A dispenser for comminuted materials, comprising a body member having a normally upright bore intercepted by a cross-bore, a dispensing member rotatably fitting the cross-bore and having a normally upwardly facing pocket therein, a gate member pivoted to the body and normally closing the lower end of the upright bore, an oscillatable actuator, and a mechanism connecting the actuator with both of the said members whereby a movement of the actuator in one direction simultaneously rotates the dispensing member to a position in which the said pocket faces downwardly, and swings the gate to a position in which no part of the gate underhangs the lower end of the upright bore; the part of the said upright bore below the dispensing member having its lower end oblique to the axis of that bore, and the mechanism being arranged for moving the dispensing member in such a direction during the dispensing operation that the pocket of this member opens first into the last named bore portion at the same side of that bore portion with the said highest portion of the lower end, whereby the momentum imparted to the material in the said pocket by a rapid rotation of the dispensing member will discharge the contents of the pocket toward the highest side of the said lower end of the upright bore.

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