

March 13, 1934.

W. E. BENSON

1,950,382

DISPENSER

Filed Oct. 17, 1931

2 Sheets-Sheet 1

Fig. 1

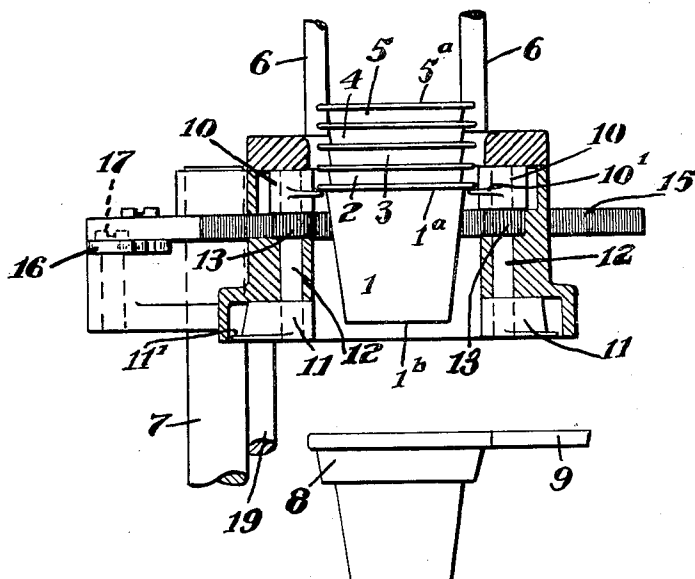
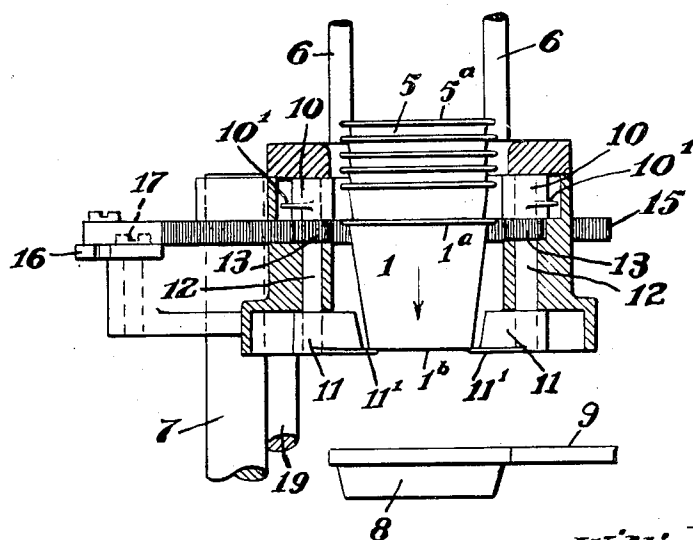


Fig. 2



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Fig. 3

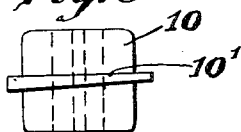


Fig. 4

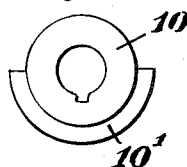


Fig. 5

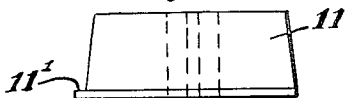


Fig. 6

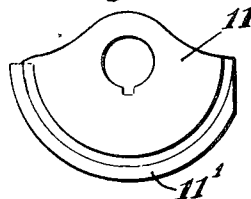


Fig. 8

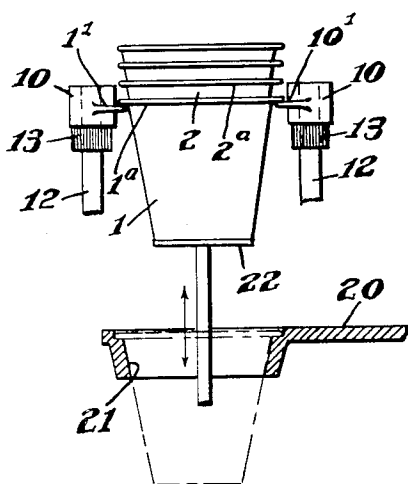
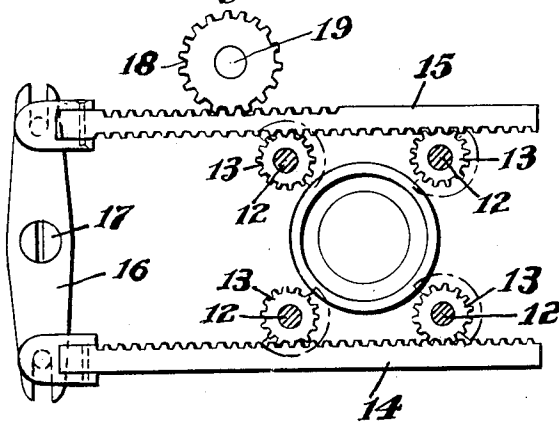


Fig. 7



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UNITED STATES PATENT OFFICE

1,950,382

DISPENSER

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Benson, deceased

Application October 17, 1931, Serial No. 569,466

7 Claims. (Cl. 312-44)

This invention relates to the dispensing of such nested articles as paper cups or like containers which are arranged in a stack and delivered singly, usually by successive withdrawal of the lowermost cup in the stack column.

For the purposes of this application, I shall discuss my invention in its adaptation to an automatic filling machine such as an ice cream machine, in which use it finds a field of immediate practicability. This treatment is, of course, purely illustrative and in no way limiting, since the principles of my invention may readily be adapted to the dispensing of the ordinary drinking or fountain cups, where the cups are simply withdrawn from their stack by hand and filled.

Where the cup feed, however, is a related step in the sequence of operation of such co-ordinated organization as an automatic filling machine, in which the cups are successively fed, filled and capped in timed relation to each other, it is of the utmost importance that the cup feed mechanism shall be positive and reliable in operation, since any failure of cup feed causes the filling charge intended for that particular cup to be spilled into the machine itself, thereby soiling the machine as well as the adjacent cups.

Being nested, the cups tend to adhere to each other, particularly if of paper, in the stack, so that it frequently happens either that no cup is withdrawn from the stack and presented to the cup filling mechanism, or else that more than one cup is withdrawn and presented, the result in either instance being disastrous.

To avoid this, I have devised a dispensing mechanism which embodies that positiveness and certainty of operation so essential in a device of this character. My dispenser is so constructed and operated as to permit one cup, and only one cup, to be withdrawn at a time from the stack and fed to the turn table of the filling machine. In addition, my dispenser is so constructed as to be readily installed regardless of size, shape, or material of the cup being fed, or the operating speed of the machine, and to operate reliably and accurately in such machine under all conditions of service.

In carrying out my invention, I successively engage the lowermost cup in the stack first at its rolled upper edge or rim and thereafter at its bottom, instead of depending upon continuous engagement of the cup rim only, as has been the case heretofore where a worm or screw-off separating unit has been employed to withdraw the cups singly from the stack. In thus departing from standard practice, I am able to effect a

more positive and reliable separation of the cup than heretofore, since the cups vary little if any at their bottoms but may vary considerably at their rolled rims. Such variation in cup rim introduces a factor of error which I am able entirely to avoid.

In the accompanying drawings I illustrate a form of dispenser which I have found highly satisfactory under actual service conditions.

In such drawings:—

Fig. 1 is an elevation, partly in section, at the cup-feed station of an automatic filling machine equipped with cup dispensing mechanism in accordance with my present invention, the parts being shown in the positions they occupy during an initial phase of their operation.

Fig. 2 is a similar view but showing the parts in a subsequent phase of their operation.

Figs. 3 and 4 are, respectively, side and plan views of one of the upper, or rim-engaging, units of my dispensing mechanism, removed.

Figs. 5 and 6, are respectively, similar views of one of the lower, or bottom-engaging, units of my dispenser removed.

Fig. 7 is a plan view illustrating a preferred form of mechanism for actuating my dispenser in properly timed relation to the other moving parts of the automatic filling machine, and

Fig. 8 is a fragmentary view illustrating a modified form of dispenser.

In an automatic filling machine of the character contemplated herein, the receptacles, as for example, a nested column of cups 1, 2, 3, 4, 5 etc. having rolled edges or rims 1^a and substantially flat bottoms 1^b, are contained in any suitable cup chute as indicated at 6, which is supported at its lower end, as at 7, over the turn table of the filling machine. The lowermost cups in the column are successively withdrawn from said cup tube 6 and placed in the pockets 8 of an intermittently rotating turn table 9 of which the filling machine which carries them first beneath the material hopper where each receives a metered charge of the filling material, as ice cream and afterwards to a capping station where each filled cup is closed by a cap.

While particularly intended for use in a machine of this type, my invention is not confined to such use but may be used in connection with the dispensing of any nested column of containers. Regardless of the type of machine or container used, my dispensing mechanism positively and accurately withdraws the outermost container only from the stack. Where the stack is vertical such outermost container may conveniently be

the lowermost container in the column, and is shown in these drawings.

Considering the vertical column therefore as typical and the lowermost cup in such column as the cup to be withdrawn, such withdrawal may be effected conveniently by means of two superposed series of rotating dispensing units 10 and 11, respectively, between which the cup column is centered. Preferably there are four of these units in each series, and each unit series is arranged symmetrically about the cup column. My invention is not limited, however, to any specific number of units, nor to any precise arrangement of such units.

Both series of units are mounted for simultaneous operating movement relative to the cup column and may be actuated in any suitable manner. Such movement may be either an oscillating movement or a continuous rotating movement. For the purposes of this application I have shown the units as oscillating but this showing is only illustrative and in no way limiting, as good results may also be obtained if the units are continuously rotated.

In either instance, both the upper series of units 10 and the lower series of units 11 may be keyed to common shafts 12 journaled vertically in suitable bearings symmetrically about the cup tube. Each shaft 12 is provided between its ends with a gear 13 meshing with racks 14 and 15 which are yoked together as by rack lever 16. The rack lever pivots about pivot 17 and the racks are actuated in unison from any suitable drive.

For this purpose, one rack, here shown as rack 15 may have a double series of rack teeth, the inner series meshing with the gears 13 of the two adjacent shafts 12 and the outer series meshing with the gear 18 on a drive shaft 19.

One of the upper series of dispensing units 10 is shown in detail in Figs. 3 and 4 and comprises a cylindrical body portion from which extends a cam surface or ledge 10' adapted for underlying bearing horizontally beneath the projecting flange or rim 1^a of the lowermost cup 1 in the cup column. Such ledge 10' is tapered as appears in Fig. 3 and extends substantially only half way around the circumference of the unit, as clearly appears in Fig. 4.

One of the lower series of dispensing units 11 is detailed in Figs. 5 and 6, and comprises a tapered body portion from which extends a horizontally disposed cam surface or ledge 11' which like the ledge 10' extends substantially only half way about the circumference of the unit. The distance between the ledges 10' and 11' is preferably slightly greater than the height of a cup so that when the ledge 10' is rotated into position to release the rim 1^a of the lowermost cup 1, the cup may drop onto the ledge 11', which at this moment has been rotated into position to support the bottom 1^b of the now released cup.

In operation, both the upper and the lower series of units 10 and 11 rotate simultaneously. The relation of the ledges 10' and 11' to each other is such, however, that as the upper ledge series 10' rotate into engagement with the cup rim 1^a of the lowermost cup 1 in the stack, the lower ledge series 11' is approximately 180° removed from the ledge position 10' or in other words, the ledge series 11' is not in position to engage and support the bottom 1^b of said cup. (See Fig. 1.)

As the ledges 10' and 11' continue their rotation, the ledges 10' progressively separate the

cup 1 from the cup 2 next above whereupon it drops by gravity onto the ledges 11' which by now have rotated into position to support the bottom of said cup. (See Fig. 2.)

This occurs while shafts 12 are rotating through an arc of approximately 180°. With the oscillating type of drive shown, the shafts 12 now reverse their rotation for 180° approximately, during which time the bottom ledges 11' are returned to the position of Fig. 1, permitting the now released cup 1 to drop into the pocket 8 of the turn table 9, and the upper ledges 10' again to engage under the rim 2^a of the now lowermost cup 2 in the stack, thus supporting the stack of cups from falling.

Where the units 10 and 11 are continuously rotated in the same direction, the dispensing action is the same, except that the direction of rotation of the shafts 12 is not reversed.

By tapering the bodies of the lower units 11 above the ledges 11', I am able positively to guide the cup into the pocket 8. Such taper corresponds approximately to the taper of the cup wall.

In the modification of Fig. 8, the lower units 11 are replaced in part by forming the cup holes in the usual dialing plate 20 of the filling machine as tapered guiding surfaces 21 and by mounting beneath such plate a platform plunger 22 adapted on its upstroke to support the bottom of the cup as it drops from the ledges 10' and on its downstroke to deposit such cup in the pocket 8 of the turn table 9. This plunger is operated by any suitable means (not shown) in properly timed relation to the rotation of the units 10.

Various modifications in the construction and operation of my device may obviously be resorted to if within the spirit and scope of my invention as defined by the appended claims.

What I therefore claim and desire to secure by Letters Patent is:—

1. In a device for dispensing articles from a stack comprising a column of nested articles, a series of rotatable dispensing units disposed symmetrically about the stack, each unit comprising a member adapted to engage the top of the lowermost article in the stack during the initial phase of rotation of said unit and a second member adapted to support the bottom of said article as said top passes from said first member and to discharge said article as said first-named member engages the top of the article next above.

2. In a device for dispensing articles from a stack comprising a column of nested articles having rolled edges, a series of dispensing units disposed symmetrically about the stack, each unit consisting of a rotatable member having an upper ledge extending from a portion of its circumference and a lower ledge extending from another portion of the circumference of said unit and vertically spaced from said upper ledge a distance greater than the height of a cup, said upper ledge in the initial phase of rotation supporting said stack by contact with the rolled edge of the lowermost cup, said edge passing from said upper ledge in the subsequent phase of rotation and the bottom of said cup contacting and being supported by said lower ledge as said edge leaves said upper ledge, said lowermost article thereafter passing from said lower ledge and being discharged and the second lowermost article contacting and being supported by said upper ledge.

3. In a device for dispensing articles from a

stack comprising a column of nested articles having rolled edges, a series of dispensing units disposed symmetrically about the stack, each unit consisting of a rotatable member having an upper ledge extending from a portion of its circumference and a lower ledge extending from another portion of the circumference of said unit, and vertically spaced from said upper ledge a distance greater than the height of a cup, said upper ledge in the initial phase of rotation supporting said stack by contact with the rolled edge of the lowermost cup, said edge passing from said upper ledge in the subsequent phase of rotation and the bottom of said cup contacting and being supported by said lower ledge as said edge leaves said upper ledge, said lowermost article thereafter passing from said lower ledge and being discharged and the second lowermost article contacting and being supported by said upper ledge, said unit being tapered to correspond to the taper of said cup whereby said cup is guided vertically in its downward passage.

4. In a device for dispensing articles from a stack comprising a column of nested articles having rolled edges, a series of dispensing units disposed symmetrically about the stack, each unit consisting of a rotatable member having an upper ledge extending from a portion of its circumference and a lower ledge extending from another portion of the circumference of said unit and vertically spaced from said upper ledge a distance greater than the height of a cup, said upper ledge in the initial phase of rotation supporting said stack by contact with the rolled edge of the lowermost cup, said edge passing from said upper ledge in the subsequent phase of rotation and the bottom of said cup contacting and being supported by said lower ledge as said edge leaves said upper ledge, said lowermost article thereafter passing from said lower ledge and being discharged and the second lowermost article contacting and being supported by said upper ledge, said unit being tapered to correspond to the taper of said cup whereby said cup is guided vertically in its downward passage.

ported by said lower ledge as said edge leaves said upper ledge, said lowermost article thereafter passing from said lower ledge and being discharged and the remaining second lowermost article contacting and being supported by said ledge, and means vertically guiding said cup after it passes from said lower ledge.

5. In a device for dispensing articles from a stack comprising a column of nested articles having projecting edges, two superposed series of simultaneously rotating dispensing units disposed symmetrically about the stack, the upper series presenting surfaces adapted to engage the projecting edge of the lowermost article in the stack during one phase of their rotation and to release such edge during a subsequent phase of rotation and the lower series presenting surfaces so disposed as to said first-named surfaces as in one phase of their rotation to support the bottom of the freed article when released by said first-named surfaces and in a subsequent phase of rotation to release said bottom to permit complete discharge of the article, said lower series of dispensing units being tapered to correspond substantially to the taper of the articles being dispensed whereby to guide the articles towards their discharged position.

6. A device as claimed in claim 5, the surfaces of said upper series of dispensing units being continuously horizontal.

7. A device as claimed in claim 5, the surfaces of both said upper and said lower series of dispensing units being likewise continuously horizontal, the surfaces of said lower series starting at points which are substantially the finishing points of said upper series of surfaces.

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