May 11, 1943. J. P. ZWEBER ET AL 2,318,911

TABLET CRUSHER

Filed April 7, 1941

Fig. 2

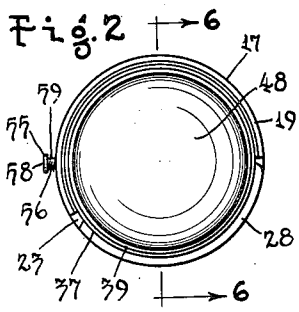


Fig. 8

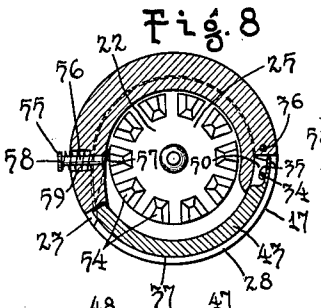


Fig. 5

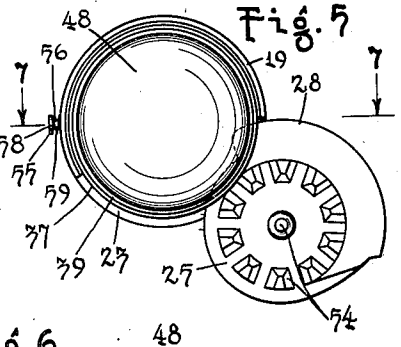


Fig. 1

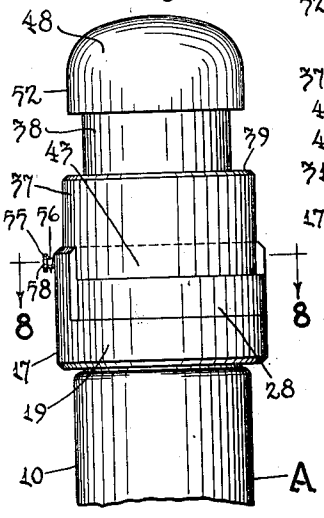


Fig. 6

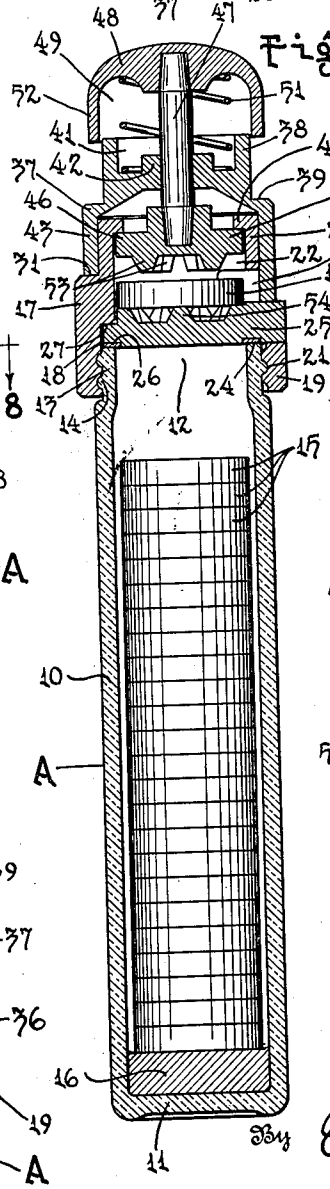


Fig. 4

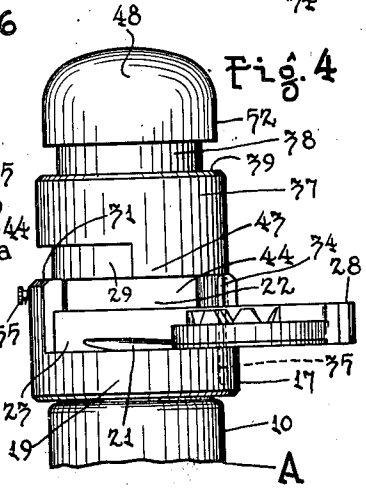


Fig. 3

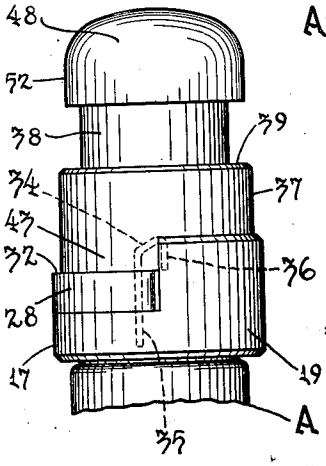
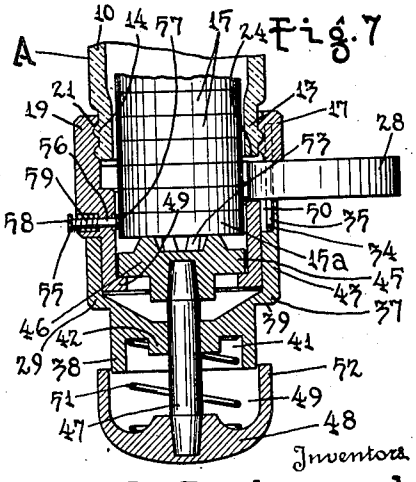


Fig. 7



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TABLET CRUSHER

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Application April 7, 1941, Serial No. 387,164

13 Claims. (Cl. 83—10)

Our invention relates to tablet crushers and has for an object to provide an extremely simple and practical construction by means of which tablets used for medicinal purposes may be easily and quickly crushed to promote rapid solution of the same.

Another object of the invention resides in providing a highly sanitary device by means of which the tablet may be crushed without touching the tablet with the hands.

An object of the invention resides in providing a tablet crusher which may be attached to a bottle or receptacle for tablets and which forms a closure for the receptacle.

Another object of the invention resides in constructing the tablet crusher with mortar having an opening in the lowermost portion thereof through which a tablet may be passed into the mortar from the receptacle and while attached to the receptacle.

A still further object of the invention resides in providing a platen movable into position across said opening to support a tablet during crushing.

A feature of the invention resides in utilizing said platen as a closure for the receptacle.

A still further object of the invention resides in providing a pestle for the mortar and in providing means carried by the mortar for guiding the pestle for rotary movement and for movement toward and from the tablet.

Another object of the invention resides in constructing the mortar with a lateral discharge opening at the locality of the platen and in providing a closure for the discharge opening carried by the mortar.

A feature of the invention resides in providing resilient means for urging the pestle away from the tablet.

Another object of the invention resides in providing means for temporarily holding a tablet within the mortar while the platen is being moved to operative position.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawing illustrating our invention,

Fig. 1 is an elevational view of a portion of a receptacle for tablets illustrating an embodiment of our invention applied thereto.

Fig. 2 is a plan view of the structure shown in Fig. 1.

Fig. 3 is a view similar to Fig. 1 viewed from another side of the device.

Fig. 4 is a view similar to Fig. 1 showing the parts in altered position.

Fig. 5 is a plan view of the structure shown in Fig. 3.

Fig. 6 is an elevational sectional view taken on line 6—6 of Fig. 2.

Fig. 7 is an elevational sectional view taken on line 7—7 of Fig. 5 and showing the receptacle and tablet crusher in inverted position.

Fig. 8 is a cross sectional view taken on line 8—8 of Fig. 1.

In the dispensing of soluble tablets for medicinal purposes it usually requires an appreciable amount of time for the tablet to dissolve. Where the tablet has to be crushed in an ordinary mortar, sanitation is lacking and at the same time considerable inconvenience results. The present invention provides a device which may be directly attached to the neck of the receptacle containing the tablets and forms a closure therefor, and which may be conveniently used whenever desired without removal from the receptacle and without manually handling or touching the tablets.

For the purpose of illustrating our invention we have shown a receptacle A in the nature of a long cylindrical bottle which has a body portion 10, a bottom 11 and is open at its upper end, as indicated at 12. The open end of this bottle is provided with a neck 13 issuing from the body 10 and which has external threads 14 on which a suitable cap or closure may be screwed. Within the interior of the body 10 of the receptacle A is disposed a number of tablets 15 which are arranged one upon the other, and which rest upon a cushion pad 16 which may consist of a wad of cotton. The body 10 is tubular in form and of proper dimensions to receive the tablets and the open end 12 thereof is of suitable dimensions to pass the tablets through the same and out of the receptacle or bottle.

The invention proper comprises a mortar 17 which has an opening 18 at the lower end thereof. Adjacent this opening the mortar is constructed with a tubular portion 19 which is formed with internal threads 21 adapted to screw upon the threads 14 of neck 13. The opening 18 registers with the opening 12 and is of sufficient dimensions to pass the tablets 15 through the same and into the interior compartment 22 of the mortar where the crushing of the tablet occurs.

The mortar 17 is also constructed with a lateral opening 23 at the locality of the upper edge

24 of the neck 13 of bottle A. Insertable through this opening is a platen 25 which is adapted to extend across the opening 18 and forms a bottom for the mortar. This platen also forms a closure for the bottle A and is provided with a gasket 26 adapted to rest upon the upper edge 24 of the neck 13. The mortar 17 is provided with a shoulder 27 which engages the platen 25 and upon screwing of the mortar upon the threads 14 and neck 13 the said shoulder forces the gasket 26 into engagement with the edge 24 of the receptacle and effects an air-tight closure for the same.

The tubular portion 19 of the mortar 17 is provided with a discharge opening 44 which is situated immediately above the opening 23 through which the platen is inserted and from which the contents of the compartment 22 may be discharged when the device is held in the proper position and the said discharge opening uncovered.

The platen 25 is pivotally connected to the mortar 17 by means of a construction, best shown in Figs. 1 and 8. The platen 25, when inserted into the mortar 17, has a rim portion 28 which fills up the lateral opening 23 and lies flush with the exterior of the tubular portion 19 of the mortar. The mortar is constructed at its upper end with a tubular portion 29 of smaller dimensions than the tubular portion 19 which forms a ledge 31 upon the exterior of the mortar and the shoulder 27 upon the interior of the mortar. Immediately above the lateral opening 23 the portion 19 is of the same diameter as the portion 29 so that the upper surface 32 of the rim 28 projects outwardly beyond the tubular portion 29, as shown in Fig. 3. For pivoting the platen 25 a pintle 34 is employed which is in the form of a hair pin having two legs 35 and 36. The leg 35 extends through the platen 25 and into the tubular portion 19 of the mortar. The leg 36 extends through the ledge 31 and into the portion 19 at the uppermost part thereof. By means of this construction the pintle is anchored and the platen mounted for swinging movement into and out of the compartment 22 of the mortar 17 through the lateral opening 23.

Encircling the tubular portion 29 of mortar 17 is a closure sleeve 37 which is formed with a neck 38 extending upwardly therefrom and offset relative to the sleeve 37 to form an inwardly projecting shoulder 39. Neck 38 has a cavity 41 in the upper portion thereof and a boss 42 extends across the said neck and forms a bottom to the said cavity. The sleeve 37 is slidably mounted on the tubular portion 29 and is formed with a lip 43 projecting downwardly therefrom, which lip is adapted to cover the discharge opening 44. The said lip is formed with a recess 50 which, when the sleeve 37 is in closing position, conceals the pintle 34.

The closure sleeve 37 supports a pestle which is indicated in its entirety by the reference numeral 45. This pestle consists of a head 46 which is attached to a stem 47, constructed of metal or some similar material. A knob 48 is secured to the end of the said stem and serves as a means for manipulating the pestle. The knob 48 is preferably constructed with a hollow 49 for a purpose to be presently described. The stem 47 is slidably and rotatably mounted in the boss 42 of closure sleeve 37 and permits of the head 46 being brought toward the platen 25 and rotated relative thereto. The head 46 of the pestle 45 is retained within compartment 22 of mortar 17 by means of an inwardly extending flange 49 formed on the upper edge of the tubular portion 29 of said mortar. A compression coil spring 51 disposed within the cavity 41 of closure 37 and the hollow 49 of knob 48 engages the boss 42 and said knob and urges the pestle to its extreme upper position, as shown in Fig. 6. The knob 48 is constructed with a skirt 52 which reaches over and encircles the neck 38 of closure 37 to completely enclose and protect the spring 51. The head 46 of pestle 45 and the platen 25 are constructed with facing teeth 53 and 54 which co-act to grind up the tablet contained within the compartment 22 when the knob 48 is urged toward the platen 25 and rotated. The various parts of the pestle are attached to one another as by press fits after assembled with reference to the mortar and the closure sleeve, or the same may be secured together in any other suitable manner.

In order to retain a single tablet in the compartment 22 a holding device is employed which is indicated in its entirety by the reference numeral 55 and which is best shown in Fig. 7. This holding device comprises a plunger 56 which extends through the wall of the tubular portion 19 of mortar 17 and which is constructed with a head 57 at one end adapted to be projected into the compartment 22 and to engage the periphery of a tablet disposed within said compartment. The said plunger has an operating button 58 accessible from the exterior and is moved to its extreme inoperative position by means of a compression coil spring 59 seated at one end against a part of the wall of the tubular portion 19 of mortar 17 and against the said button 58.

The method of using the invention is as follows: The usual cap or closure furnished with a bottle containing the tablets is removed and the threaded tubular portion 19 of our tablet crusher screwed upon the threads 14 of the neck 13 of said bottle. When the device is intended to form a closure for the bottle the platen 25 is projected inwardly into the compartment 22 and the mortar 17 screwed down until the gasket 26 of said platen forms a seal with the edge 24 of the neck 13 of the bottle. When it becomes desirable to crush a tablet the mortar 17 is unscrewed sufficiently to release the platen 25 from engagement with the neck of the bottle and said platen swung outwardly as shown in Fig. 4. The bottle A and the tablet crusher are then inverted, as shown in Fig. 7, which causes the tablets 15 therein to become supported by the head 46 of the pestle 45. In such position the holding device 55 is in position to engage the lowermost tablet 15*a*. By applying pressure to the button 58 the tablet is urged against the opposite wall of the mortar and upon inversion of the bottle and tablet crusher the remaining tablets drop back into the interior of the bottle A. The platen 25 is next projected inwardly into the interior of the compartment 22 and upon relieving pressure on the button 58 the tablet 15*a* drops upon the platen 25 and the parts assume the position shown in Fig. 6. The mortar 17 is then screwed down to tighten the same on the threads 14 of bottle A and to hold the platen 25 rigidly in position. The closure 37 is next moved into closing position. Pressure is now applied to the knob 48 and the same given a rotational movement. This causes the head 46 of pestle 45 to engage the tablet 15*a* and crush and grind the same. Upon

raising of the closure **37** the discharge opening **44** is uncovered and by rotating said closure lip **43** can be caused to rest upon the ledge **31** thus maintaining the discharge opening **44** open. It will be noted that the spring **51** in addition to urging the pestle **45** upwardly also urges the closure **37** downwardly to close the opening **44**.

The advantages of our invention are manifest. The grinding or crushing of the tablets may be accomplished without touching or manually handling the same. The device may be used with bottles or receptacles in which the tablets are sold. The device not only serves to crush the tablets but forms a closure for the bottle or receptacle containing the tablets. The device is compact and does not occupy an appreciable amount of space. The method of operation of our invention is extremely simple and practical. With our invention saving of time occurs in the handling of and crushing of the tablets. Our invention can be manufactured to be sold at a reasonable price. The device is extremely attractive and enhances the appearance of the bottle or receptacle.

Changes in the specific form of our invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of our invention.

Having described our invention, what we claim as new and desire to protect by Letters Patent is:

1. A tablet crusher comprising a mortar having an opening at the lower end, threads at the lower end of the mortar for attaching the same to the threaded neck of a receptacle for tablets, said opening bringing the mortar into communication with the receptacle and being of sufficient dimensions to pass a tablet into the mortar, a platen movable across said opening and serving to support a tablet in the mortar, said platen forming a closure for the receptacle and resting upon the free edge of the neck thereof, and means carried by said mortar for engaging the platen to urge the same against the end of the neck of the receptacle upon screwing the threads of the mortar upon the threads of the receptacle, and a pestle for forcing the tablet against the platen.

2. A tablet crusher comprising a mortar having an opening at the lower end, threads at the lower end of the mortar for attaching the same to the threaded neck of a receptacle for tablets, said opening bringing the mortar into communication with the receptacle and being of sufficient dimensions to pass a tablet into the mortar, said mortar having a lateral opening disposed at the locality of the upper edge of the neck of the receptacle, a platen movable into said mortar through said second named opening and extending across the first named opening, said platen serving to support a tablet in the mortar, said platen forming a closure for the receptacle, and means on said mortar for urging the platen into engagement with the upper end of the neck of said receptacle upon screwing of the mortar on the threads of the neck of the receptacle, and a pestle for forcing the tablet against the platen.

3. A tablet crusher comprising a mortar having an opening at the lower end, means at the lower end of the mortar for attaching the same to a receptacle for tablets, said opening bringing the mortar into communication with the receptacle and being of sufficient dimensions to pass a tablet into the mortar, said mortar having a second opening in the lower end thereof disposed laterally with respect to the first named opening, a platen movable through said second named opening and across said first named opening to support a tablet in the mortar, said lateral opening being enlarged at a locality above the platen to form a discharge opening for discharging the crushed tablet, a closure carried by said mortar for closing said discharge opening, and a pestle for forcing the tablet against the platen.

4. A tablet crusher comprising a mortar having an opening at the lower end, means at the lower end of the mortar for attaching the same to a receptacle for tablets, said opening bringing the mortar into communication with the receptacle and being of sufficient dimensions to pass a tablet into the mortar, said mortar having a second opening in the lower end thereof disposed laterally with respect to the first named opening, a platen movable through said second named opening and across said first named opening to support a tablet in the mortar, said mortar having a discharge opening for discharging the crushed tablet therefrom, a sleeve carried by said mortar and slidable axially along the same, means on said sleeve for closing said discharge opening, and a pestle for forcing the tablet against the platen.

5. A tablet crusher comprising a mortar having an opening at the lower end, means at the lower end of the mortar for attaching the same to a receptacle for tablets, said opening bringing the mortar into communication with the receptacle and being of sufficient dimensions to pass a tablet into the mortar, said mortar having a second opening in the lower end thereof disposed laterally with respect to the first named opening, a platen movable through said second named opening and across said first named opening to support a tablet in the mortar, said mortar having a discharge opening for discharging the crushed tablet, a sleeve carried by said mortar and slidable axially along the same, a lip on said sleeve for closing said discharge opening, and a pestle for forcing the tablet against the platen.

6. A tablet crusher comprising a mortar for the reception of a tablet to be crushed, said mortar having a lateral discharge opening, a closure for closing said opening, a pestle for crushing the tablet, and means carried by the closure for guiding the pestle for rotary movement and for movement toward and from the tablet.

7. A tablet crusher comprising a mortar for the reception of a tablet to be crushed, said mortar having a lateral discharge opening, a closure for closing said opening, a pestle for crushing the tablet, means carried by the closure for guiding the pestle for rotary movement and for movement toward and from the tablet, and resilient means acting between said closure and pestle for moving the pestle away from the tablet.

8. A tablet crusher comprising a mortar for the reception of a tablet to be crushed, said mortar having a lateral discharge opening, a sleeve encircling said mortar and slidable along the same, said sleeve having means for closing said discharge opening, a bushing formed on said sleeve, and a pestle for crushing the tablet, said pestle having a shank rotatably and slidably mounted in said bushing.

9. A tablet crusher comprising a mortar having an opening at the lower end, means at the lower end of the mortar for attaching the same to a receptacle for a plurality of tablets, said opening bringing the mortar into communication with the receptacle and being of sufficient dimensions to

pass a number of the tablets through said opening upon inversion of the receptacle and tablet crusher, means for engaging the innermost of the tablets and holding the same within the mortar upon righting of the receptacle and tablet crusher, a platen movable from a position clear of said opening to a position obstructing said opening and outwardly of said held tablet, and a pestle for forcing the tablet against the platen.

10. A tablet crusher comprising a mortar having an opening at the lower end, means at the lower end of the mortar for attaching the same to a receptacle for a plurality of tablets, said opening bringing the mortar into communication with the receptacle and being of sufficient dimensions to pass a number of the tablets through said opening upon inversion of the receptacle and tablet crusher, a holding member movable laterally of the opening for engaging the innermost of the tablets and holding the same within the mortar upon righting of the receptacle and tablet crusher, a platen movable from a position clear of said opening to a position obstructing said opening and outwardly of said held tablet, and a pestle for forcing the tablet against the platen.

11. A tablet crusher comprising a mortar having an opening at the lower end, means at the lower end of the mortar for attaching the same to a receptacle for tablets, said opening bringing the mortar into communication with the receptacle and being of sufficient dimensions to pass a tablet into the mortar, the walls of said receptacle lying substantially in continuation of the walls of the mortar to guide the tablets into the mortar, a platen movable across said opening and serving to support a tablet in the mortar and to close communication between the mortar and receptacle, said mortar having a lateral discharge opening, means for closing said discharge opening, a pestle at the other end of the mortar for forcing the tablet against the platen and means fixed relative to the mortar for guiding the pestle for movement relative to the mortar.

12. A tablet crusher comprising a mortar having an opening at the lower end, means at the lower end of the mortar for attaching the same to a receptacle for tablets, said opening bringing the mortar into communication with the receptacle and being of sufficient dimensions to pass a tablet into the mortar, the walls of said receptacle lying substantially in continuation of the walls of the mortar to guide the tablets into the mortar, said mortar having a second opening in the lower end thereof disposed laterally with respect to the first named opening, a platen movable into said second named opening and across said first named opening to support a tablet in the mortar, said second named opening extending above the platen to form a discharge opening and a pestle for forcing the tablet against the platen.

13. A tablet crusher comprising a mortar having an opening at the lower end, means at the lower end of the mortar for attaching the same to a receptacle for tablets, said opening bringing the mortar into communication with the receptacle and being of sufficient dimensions to pass a tablet into the mortar, the walls of said receptacle lying substantially in continuation of the walls of the mortar to guide the tablets into the mortar, a platen movable across said opening and serving to support a tablet in the mortar and to close communication between the mortar and receptacle, a pestle at the other end of the mortar for forcing the tablet against the platen and means fixed relative to the mortar for guiding the pestle for movement relative to the mortar.

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