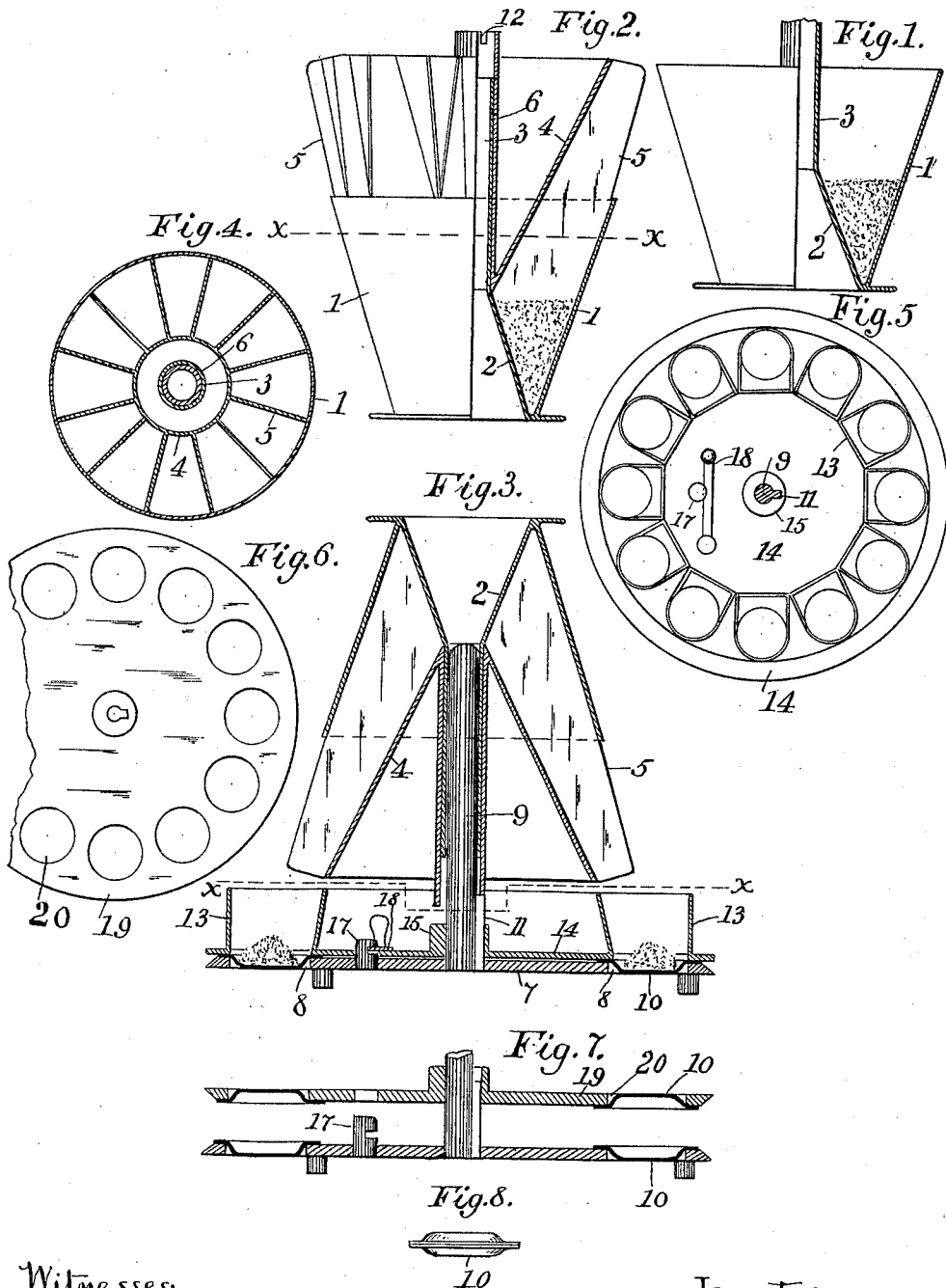


J. D. KNOWLTON.
 DRUGGIST'S DEVICE FOR DIVIDING POWDERS.
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UNITED STATES PATENT OFFICE.

JOHN D. KNOWLTON, OF WESTBROOK, MAINE.

DRUGGIST'S DEVICE FOR DIVIDING POWDERS.

1,037,023.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN D. KNOWLTON, of Westbrook, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Druggists' Devices for Dividing Powders, of which the following is a specification.

My invention relates to a device for dividing powders into equal portions, and is designed for the use of prescription druggists to facilitate the compounding of drugs in powder form. This work is now commonly done by placing the powder on a flat smooth surface and by the aid of a knife or other like instrument dividing it by the eye into piles supposed to contain equal quantities. This method is a very slow and inaccurate one, and my invention is directed to the devising of an apparatus which will enable the work to be done more rapidly and accurately.

My invention will be readily understood by means of the accompanying drawing in which is shown a device, constructed according to my invention in its preferable form and designed particularly for putting up powders in capsules of the form known as "konseals." These are capsules made in two halves, each saucer-shaped and made of starchy substance capable of sticking together when moistened.

In the drawing, Figure 1, is a part section and part elevation through the receiving vessel. Fig. 2, is a like view of the combined receiving vessel and dividing member. Fig. 3, is a central vertical section through the apparatus after the powders have been deposited in the half capsules. Fig. 4, is a section on the line X X of Fig. 2. Fig. 5, is a section on the line X X of Fig. 3. Fig. 6, is a plan of the sealing plate. Fig. 7, is a section like the lower half of Fig. 3, with the sealing plate substituted for the hopper member, and Fig. 8, is a view of the capsule.

I make use of a receiving vessel in which the mass of powder is first placed to get it into condition to be divided. This vessel has an annular space of such form that when the vessel is slightly jarred the powder will tend to settle with a horizontal upper surface. I have found that a vessel having an annular space which tapers downward, will best accomplish this result.

As here shown, I form the receiving vessel 1 in the form of an inverted truncated cone with an inner upright cone 2, forming the

inner wall of the annular space. I have found from experience that a vessel thus formed with an annular space having two inclined and approaching surfaces will cause the surface of the powder to become almost precisely level. This is an important consideration, since if the annular mass is out of level, or if there is irregularity in the surface, the subsequent division will be imperfect. For convenience in connecting to the vessel 1, the other parts of the apparatus I secure on the upper end of the inner cone 2, a spindle preferably in the form of a hollow tube 3.

The annular mass of powder is accurately divided into an equal number of parts, in the present case twelve, by means of a radially arranged series of blades 5, adapted to fit into the annular space and to be thrust downward through the mass of powder. These blades 5 are as herein shown, secured to the outer surface of an inverted cone 4. The blades 5 thus form separate partitions to divide the powder, and the blades and the outer surface of the cone constitute a series of chutes for discharging the divided powders when the apparatus is inverted. As shown, a sleeve 6 is secured to the center of the cone 4, and this sleeve 6 is adapted to fit over the tubular spindle 3, thus centering the two parts. Means are provided for receiving the individual powders as they fall from the chutes when the apparatus is inverted. The individual powders may be received in receptacle of any desired form, by arranging them so as to register with the discharge ends of the chute. In the present instance when the powders are to be sealed in capsules, I make use of a receiving plate provided with means for retaining the half capsules and holding them in position to catch the individual powders as they fall from the chutes. As here shown, I make use of a circular plate 7, having a spindle which fits into the tube 3.

For the purpose of receiving and retaining the half capsules 10, I form openings 8 in the plate 7, these openings registering with the chutes and being positioned to receive the individual powders as they run from the chutes. A feather 11 located at the base of the spindle 9 fits in a notch 12 in the end of the sleeve and fixes the position of the plate 7 so that the openings will register with the chutes. Means are provided for guiding the individual powders into the

half capsules so that none of the material will be spilled. For this purpose, I provide a hopper member carrying a series of small hoppers or guides which are located
5 between the plate 7 and the end of the cone 4. As here shown, the small hoppers 13 are attached to the plate 14, which has a central hub 15 adapted to fit over the spindle 9. A slot in the hub 15 fits over the
10 feather 11 and locates the position of the plate 14 with respect to the plate 7. Means are provided for securing together the plates 7 and 14 so that they will hold together upon being inverted. As here shown,
15 a stud 17 is inserted in the plate 7 and it projects upward above its upper surface. An opening in the plate 14 admits the stud and a latch 18 pivoted to the plate 14 fits in a lateral slot in the stud 17. The slot receives the edge of the latch 18 and serves
20 to secure the two parts together.

After the individual powders are deposited in the half capsules, the other halves of the capsules are cemented to the filled
25 halves. This is done as here shown, by means of a circular sealing plate 19 which fits over the spindle 9. The plate 19 is provided with openings 20, similar to those in the plate 7, so that the half capsules may be
30 placed therein in an inverted position. The openings 20 are of such size that the half capsules will go in with a close fit, and the plate may be inverted without dropping out the capsules. A hole is formed in the plate
35 19 to admit the stud 17.

Having thus described the construction of my apparatus, its operation is easily understood. The whole amount of powder is placed in the receiving vessel and the latter
40 is slightly jarred by striking it down on a level surface or otherwise. The powder distributes itself uniformly in the annular space. The dividing member is now slipped on over the spindle 3, and the blades pass
45 down through the mass of powder, forming twelve partitions which separate the powder into twelve equal parts. The hopper member is now slipped on over the spindle 9 of the receiving plate 7, the latter having previously
50 been loaded with half capsules, and the two are fastened together by means of the latch 18. The hopper member and the receiving member being thus secured together, are now inverted and the spindle 9
55 is thrust down through the tube 3, as shown in Fig. 3, in an inverted position. The apparatus is now seized by both hands and by a quick motion inverted into the positions shown in Fig. 3. The individual powders
60 now run down the several chutes into the half capsules, being confined by the hoppers 13, so that they do not spill outside the capsules. The hopper member and its superposed parts are now removed, and the sealing plate is loaded with half capsules. The

edges of the half capsules in the plate 19 are now moistened by a moistening roller or otherwise, the plate 19 is slipped on the spindle 9 and the two plates brought together as indicated in Fig. 7. As soon as
70 the two halves of the capsules come in contact they will adhere, and the filled capsules may be taken out. It will be found that a very accurate division of the powders has taken place, as accurate as if they had been
75 carefully weighed.

Instead of the means for filling capsules here shown, the individual powders may be otherwise disposed of after they are separated.

Instead of making the receiving vessel with an annular space, it may be made without a center, although I find that the construction described, produces a more accurate leveling of the surface of the powder,
80 than in a vessel without a center.

When an open vessel is used, the dividing blades may be otherwise disposed than as shown above where they extend radially out from a central core.

I claim:

1. A device for dividing powders including a receiving vessel having an annular space, a dividing member consisting of an inverted cone having radial blades adapted to fit in said annular space, and to form
95 chutes for discharging the powders, and a receiving member adapted to fit on the upper end of the dividing member and containing a plurality of pockets registering with said chutes for receiving the divided powders when the apparatus is inverted.

2. A device for dividing powders including a receiving vessel having an annular space, a dividing member consisting of an inverted cone having radial blades adapted to fit in said annular space, and to form
105 chutes for discharging the powders, and a receiving member adapted to fit on the upper end of the dividing member and containing a plurality of openings adapted to hold half capsules and registering with the chutes for receiving the divided powders when the apparatus is inverted.

3. A device for dividing powders including a receiving vessel having an annular space, a dividing member consisting of an inverted cone having radial blades adapted to fit in said annular space, and to form
115 chutes for discharging the powders, a receiving member adapted to fit on the upper end of the dividing member and containing a plurality of openings adapted to hold half capsules and registering with the chutes for receiving the divided powders when the apparatus is inverted, and a hopper member
120 between the dividing and receiving members having a series of hoppers for guiding the powders from the chutes to the half capsules.

4. A device for dividing powders including a receiving vessel having an annular space, a dividing member consisting of an inverted cone having radial blades adapted to fit in said annular space and to form chutes for discharging the powders, a receiving plate having openings for retaining half capsules and registering with the chutes, a sealing plate having capsules receiving openings registering with those in the receiving plate and guides for fitting the two plates together to seal the corresponding half capsules.
5. A device for dividing powders including a receiving vessel having an annular space, a dividing member consisting of an inverted cone having radial blades adapted to fit in said annular space, and to form chutes for discharging the powders, a receiving member adapted to fit on the upper end of the dividing member and containing a plurality of openings adapted to hold half capsules and registering with the chutes for receiving the divided powders when the apparatus is inverted, and a sealing plate having capsule receiving openings registering with those in the receiving plate and guides for fitting the sealing and receiving plates together.
6. A device for dividing powders including a receiving vessel having an annular space and a central vertical tube, a dividing member consisting of a sleeve adapted to fit over said tube, an inverted cone secured to said sleeve, and a series of radial blades on the outside of said cone and fitting said annular space to form discharging chutes, a receiving plate having a central spindle adapted to fit in said tube and a series of capsule retaining openings registering with said chutes, and a sealing plate fitting over said spindle and containing capsule retaining openings registering with those in said receiving plate.
7. A device for dividing powders including a receiving vessel having an annular space and a central vertical tube, a dividing member consisting of a sleeve adapted to fit over said tube, an inverted cone secured to said sleeve, and a series of radial blades on the outside of said cone and fitting said annular space to form discharging chutes, a receiving plate having a central spindle adapted to fit in said tube and a series of capsule retaining openings registering with said chutes, and a hopper member adapted to fit over said spindle and having hoppers adapted to register with, and be interposed between the chutes and the openings in the receiving plate.
- In testimony whereof I have affixed my signature, in presence of two witnesses.
- JOHN D. KNOWLTON.
- Witnesses:
S. W. BATES,
C. B. CREIGHTON.