Feb. 17, 1942. A. L. SCHREIBER 2,273,475

PIN FOR SUPPORTING CERAMIC WARE

Filed Aug. 4, 1940

FIG. 1.

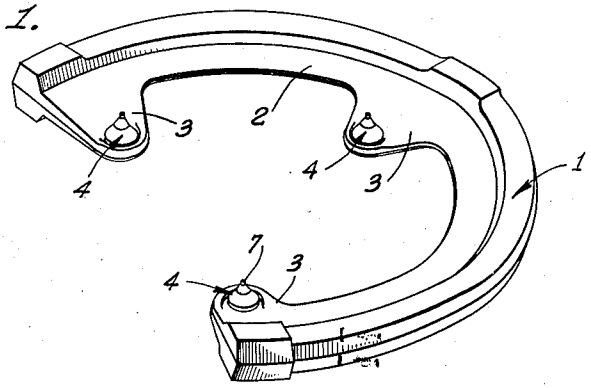


FIG. 2.

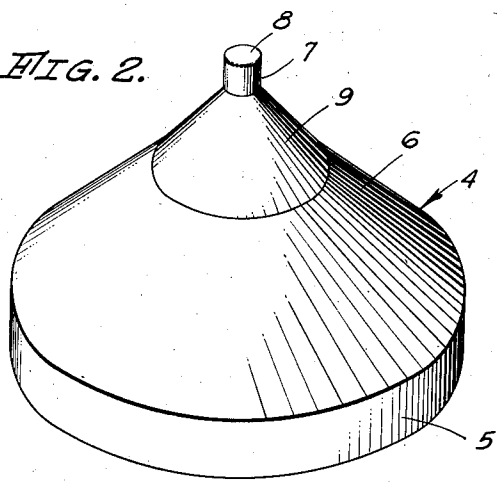
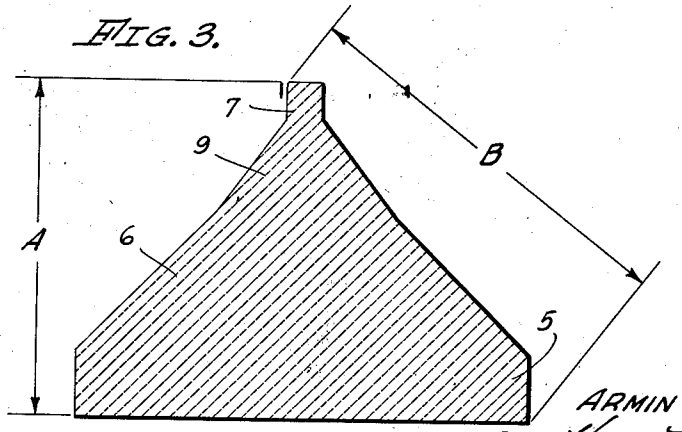


FIG. 3.



INVENTOR
ARMIN L. SCHREIBER,
BY Harold W. Keatting
ATTORNEY

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PIN FOR SUPPORTING CERAMIC WARE

Armin L. Schreiber, Altadena, Calif.

Application August 4, 1940, Serial No. 351,299

5 Claims. (Cl. 25—153)

My invention relates to a pin for supporting ceramic ware and has particular reference to a novel form of pin which finds particular utility when employed to support ceramic ware during glaze firing thereof.

In the art of manufacturing ceramic ware it is common practice to coat the various pieces of ware with a glaze material while the pieces are in the biscuit form and then to load them into a glaze firing kiln and there fire the glaze to finish the pieces. It is necessary that the piece of ware be supported during the glaze firing in such manner that the contact between the piece and the support therefor is limited to an extremely small area for the reason that an imperfection in the glaze is produced at all such points of contact. It is, therefore, the present practice to support the pieces on saggers or setters such as those shown in my Patent No. 2,208,734, issued July 23, 1940, which carry ware supporting pins having upwardly directed sharp points upon which the pieces are rested.

The present invention is directed to a ceramic ware supporting pin which while finding great utility in the ceramic ware industry generally, is particularly adapted for use with a pin feeding and placing device of the character described and claimed in my copending application Serial No. 351,467 filed August 5, 1940, and entitled "Pin feeding device" which may be used to place such ware supporting pins upon setters prior to the placing of the pieces of ware thereon. This device is particularly adapted for use with a mechanical loading device of the character described and claimed in my Patent No. 2,205,178, issued June 18, 1940, and entitled "Pottery loading device," and with setters of the character described and claimed in my aforementioned Patent No. 2,208,734.

The pin feeding and placing device which is disclosed in my aforementioned copending application includes a hopper or similar bulk storage means for supporting a supply of pins and from which pins are fed to a conveyor which moves the pins to a mechanism for placing the pins on the setters in an upright position. Since the pins may be initially placed on the conveyor in substantially any position (either upright or lying on their sides), it is necessary that all of the pins be turned to an upright position before they are placed on the setters. The above described device employs a pin engaging means for so turning the pins, which means is disposed a predetermined distance above the conveyor for engaging the upper edges of those pins which are disposed on their sides. In order that such engagement will turn such pins to an upright position without overturning those which already occupy an upright position, it is necessary that the center of gravity of the pin be disposed near the base and that the shape of the pin be such that the pin engaging means will clear those pins which are in the upright position. The shape of the pin must also be such that one pin will not later be overturned by engagement with an adjacent pin.

In addition to meeting the foregoing requirements, the pins should be sturdy so as to withstand rough handling and be inexpensive to manufacture. Such a pin should also present a relatively small area apex for engaging the piece of ware to be supported thereby in contra-distinction to the sharp points employed on present supporting devices for the reason that such sharp points tend to produce an imperfection of larger size than is produced by a flat topped pin.

It is accordingly an object of my invention to provide a ceramic ware supporting pin having a base upon which the pin may be nested and an upwardly directed flat topped apex presenting a small area surface to a piece of ware placed thereon.

It is also an object of my invention to provide a pin of the character set forth in the preceding paragraph in which the center of gravity is located near the base of the pin.

It is also an object of my invention to provide a pin of the character set forth in the preceding paragraph which includes a lower cylindrical portion surmounted by a conical portion.

It is an additional object of my invention to provide a pin of the character set forth hereinbefore in which the conical portion is surmounted by a short small diameter cylindrical apex portion.

It is a still further object of my invention to provide a pin of the character set forth in the preceding paragraphs in which the sides of the conical portion are made more steeply inclined near the apex than near the base in order to lower the center of gravity of the pin.

It is an additional object of my invention to provide a ceramic ware supporting pin in which the distance from a supporting surface to the uppermost point of a pin resting on said surface on its base is less than that of a pin occupying any other position.

Other objects and advantages of my invention will be apparent from a study of the following

specifications, read in connection with the accompanying drawing, wherein:

Fig. 1 is a perspective view illustrating the manner in which ceramic ware supporting pins constructed in accordance with my invention may be employed with setters for the purpose of supporting ceramic ware during a glaze firing operation;

Fig. 2 is an enlarged perspective view illustrating the general shape and proportions of the preferred form of pin of my invention; and

Fig. 3 is a vertical sectional view of the pin which is illustrated in Fig. 2 and indicating the relative altitudes of the pin, depending upon whether the pin is placed in an upright position or in a position lying on its side.

Referring to the drawing, I have illustrated in Fig. 1 a setter 1 which may be constructed in accordance with the disclosures contained in my Patent No. 2,208,734, and which is illustrated herein as comprising a horseshoe-shaped partial ring of suitable ceramic material, such as a partially fired clay. The ring may include an inwardly extending shelf portion 2 which carries projections or lugs 3 extending still further into the space defined by the horseshoe-shape of the setter.

The lugs 3 are intended to act as supporting members for ware supporting pins 4 which, in accordance with the preferred embodiment of my invention, are constructed along the lines illustrated in Fig. 2. As illustrated in this figure, the pin of my invention preferably includes a lower cylindrical portion 5 which is surmounted by a conical portion 6. The conical portion 6 may carry a small cylindrical apex 7 having a length at least as great as its diameter and which is provided with a flat top 8. The pin may be made of any desired size, but I have found that a pin having the general proportions of the pin illustrated in Fig. 2 and having a maximum base diameter of substantially one-half inch constitutes a conveniently sized pin for most glaze firing operations. The pin may be constructed of any refractory material, and I have found that ordinary clay of the type employed in the manufacture of pottery and china ware is an eminently suitable material from which the pins may be made. Ceramic material of this character has the advantage of being inexpensive so that the pins may be manufactured in large quantities at low cost and if properly fired, will be very durable so as to withstand a considerable amount of rough handling without causing undue breakage.

Attention is directed to the fact that the upper portion of the cone portion 6 (the upper portion being identified by reference character 9 in Fig. 2) is inclined at a somewhat steeper angle to the horizontal than is the remaining part of this conical portion. By employing such a shape, the center of gravity of the pin may be disposed more closely to the base than is the case with pins of a truly conical form for the reason that a greater quantity of material is located nearer the base than is located at greater distances from the base. I have also found that such a contour of exterior surface of the pin permits the pins to be more readily removed from a mold which may be employed to cast the pins.

It will also be noted that by making the cylindrical apex portion 7 with a length at least as great as the diameter thereof, an adequate amount of clearance between the pin and a piece of ware supported thereon is obtained, thus insuring uniform firing of the piece. Furthermore, the aforementioned flat top 8 which is provided on the apex 7 presents to the under surface of a piece of ware which is placed upon the pin a small area of contact in contra-distinction to the point contacts employed on pins prior to my invention. I have found that this small area contact actually causes the production of a smaller imperfection in the glaze than does a point contact. It appears that the molten glaze material tends to creep along the sides of the cylindrical apex portion of the pin of my invention to a lesser extent than along the sloping sides of sharp pointed pins, thus producing a considerably smaller imperfection in the glaze.

The above described pin finds particular utility when employed on a pin setting device of the character described and claimed in my aforementioned copending application. As has been pointed out hereinbefore, this device includes a conveyor means upon which pins are discharged at random so that the pins come to rest on the conveyor in a disorderly manner; that is, some pins resting on their bases, whereas other pins are disposed on their sides.

The pin setting device previously referred to includes a means for turning all of the pins to an upright position, which means comprises a pin engaging member disposed a predetermined distance above the surface of the conveyor and adapted to engage the uppermost point of any of the pins which are disposed on their sides to thereby turn such pin over to a position resting on its base. In order that this device may turn pins which are resting on their sides to an upright position without overturning those which are already in an upright position, it is necessary that the altitude of the pin as measured from the base to the apex be less than the distance from the surface of the conveyor to the uppermost point on a pin which is resting on its side. When this condition obtains, it is possible to dispose the pin engaging means a greater distance from the surface of the conveyor than that represented by the altitude of the pin as measured from the base to the apex and at a lesser distance from the conveyor than that represented by the overall height of a pin which is resting on its side. These relative dimensions are indicated in Fig. 3, the altitude of the pin as measured from the base to the apex represented by the dimension line A, whereas, the height to which the pin extends above a supporting surface when disposed on its side is represented by the dimension line B. It will be noted that this condition obtains when the pin is made with a relatively broad base and a relatively low altitude.

The aforementioned pin setting device of my invention also operates incidentally to move a considerable number of the pins into side by side abutting relation with each other. It is for this reason that I prefer to employ the lower cylindrical portion 5 for the reason that no force tending to overturn the pins is developed when they are brought into abutting relationship at the exterior surface of the cylindrical portion 5, whereas, if the conical portion 6 were carried down to the base and the cylindrical portion 5 were omitted, one pin would tend to slide up along the conical portion of an adjacent pin and thereby be overturned.

Attention is also directed to the fact that the low disposition of the center of gravity of the pin not only materially reduces the danger of one of the pins being inadvertently overturned after

having been placed on a setter in its proper location, but permits the pins to be readily erected or turned to an apex-uppermost position. For example, as is pointed out in my aforementioned copending application for a pin setting device, the low disposition of the center of gravity makes the position of the pin rather unstable when the pin is lying on its side and very stable when the pin is resting on its base, with the result that a laterally directed reciprocating or shaking movement imparted to the surface upon which the pins rest will, by reason of the inertia of the pins and their frictional engagement with the surface, serve to tip over those pins which are resting on their sides to permit them to occupy an upright position. The same shaking motion which serves to turn over those pins which are lying on their sides will not overturn the pins which are resting on their bases, with the result that very shortly after the shaking movement of the support is begun, all of the pins will have been turned to an upright or apex-uppermost position.

From the foregoing it will be observed that I have provided a ceramic ware supporting pin which, while finding particular utility when employed on mechanical or automatically operating pin setting devices, may be used with advantageous results in connection with glaze firing operations generally.

It will be noted that the pin of my invention is constructed in a rugged and sturdy fashion so as to withstand a considerable amount of handling without breakage.

Attention is also called to the shape of the pin as previously described which permits the pin to be employed with mechanical pin handling devices including a pin engaging means for turning the pin into an upright position, and that the cylindrical base employed on the bottom of the pin prevents the pins from being inadvertently turned over on their sides after having once been placed in the desired upright position.

While I have shown and described the preferred embodiment of my invention, I do not desire to be limited to any of the details of construction shown or described herein, except as defined in the appended claims.

I claim:

1. As an article of manufacture, a ware supporting pin comprising a substantially conical member having an apex portion of cylindrical form.

2. As an article of manufacture, a ware supporting pin comprising a substantially conical member having an apex portion of cylindrical form, the length of said apex portion being greater than the diameter thereof.

3. As an article of manufacture, a ware supporting pin comprising a substantially conical member having an apex portion of cylindrical form, said apex portion having a substantially plane top disposed in substantial parallelism with the base of said member.

4. As an article of manufacture, a ware supporting pin comprising a substantially conical member including a base partion defined by sides extending at substantially right angles to the base of said member, an integral body portion defined by sides sloping upwardly and inwardly from said base portion, and an integral apex portion having parallelly disposed sides extending upwardly from said body portion.

5. As an article of manufacture, a ware supporting pin comprising a substantially conical member including a base portion having the form of a right circular cylinder, an integral body portion of conical form extending upwardly from said base portion, and an integral apex portion having the form of a right circular cylinder extending upwardly from said body portion.

ARMIN L. SCHREIBER.